



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

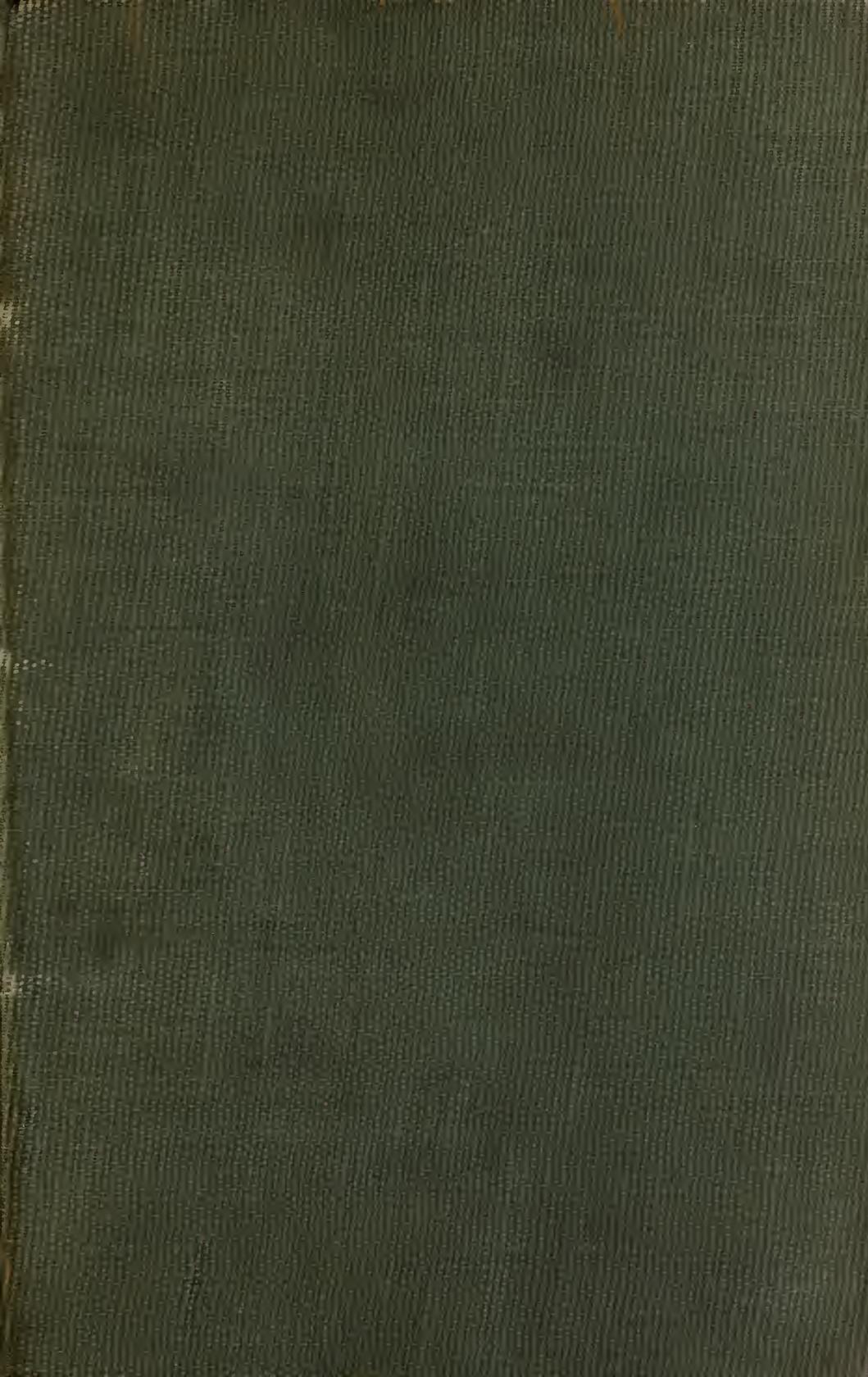
<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



LIBRARY

OF THE

UNITED STATES

DEPARTMENT OF AGRICULTURE

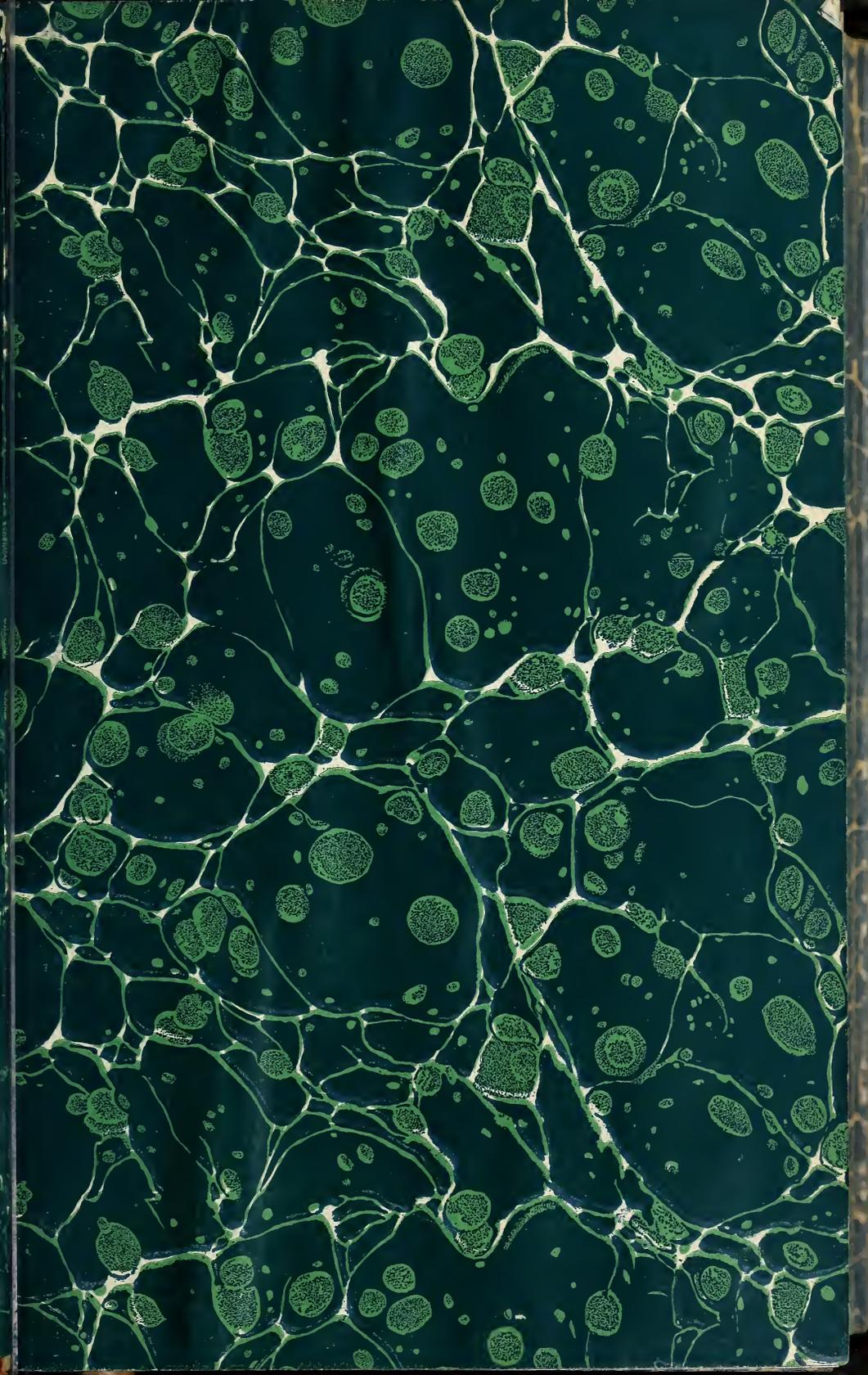
Class 1

Book

R 53 B

no. 22-35

8-1577





3
66697
7/21
U. S. DEPARTMENT OF AGRICULTURE.

PUBLIC ROAD INQUIRIES—BULLETIN NO. 22.

MARTIN DODGE, Director.

PROCEEDINGS

OF THE

THIRD ANNUAL GOOD ROADS CONVENTION

OF THE

BOARDS OF SUPERVISORS OF THE STATE OF NEW YORK,

HELD AT

ALBANY, N. Y., JANUARY 28 AND 29, 1902.



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1902.

LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
OFFICE OF PUBLIC ROAD INQUIRIES,
Washington D. C., March 27, 1902.

SIR: I have the honor to transmit herewith the proceedings of the Third Annual Good Roads Convention of the Boards of Supervisors of the State of New York, held at Albany, N. Y., January 28 and 29, 1902. This report contains much valuable information on the road subject, and will be very useful to all who are studying the question of State aid.

Many of the Southern and Western States are contemplating legislation with reference to State aid, and numerous inquiries are being made concerning the success of the plan where heretofore tried. New York being the leading State, and having applied the State-aid plan in an improved form most successfully, I have no doubt that the copious information brought out at this meeting of the boards of supervisors of the State of New York will be very interesting and beneficial to people in many of the other States.

The illustrations were furnished by the office of the New York State Engineer and Surveyor.

I recommend the publication of the proceedings of the convention as Bulletin No. 22 of this Office.

Respectfully,

MARTIN DODGE,
Director.

HON. JAMES WILSON,
Secretary of Agriculture.

CONTENTS.

TUESDAY, JANUARY 28, 1902—MORNING SESSION.

	Page.
Address of temporary chairman, State Engineer EDWARD A. BOND.....	7
Report and recommendations of the standing committee	8
Progress of road improvement in the State of New York	12
Farms and value of farm products of New York State.....	13
Letters indorsing highway improvement by State aid	14
A few practical suggestions on road building. By CHARLES W. ROSS, of New- ton, Mass.	18
Permanent organization.....	21
Address of the permanent chairman.....	21
Delegates to the convention.....	23

TUESDAY, JANUARY 28, 1902—AFTERNOON SESSION.

Money system of highway tax	26
Expression of sentiment by counties on the money system for road im- provement.....	28

WEDNESDAY, JANUARY 29, 1902—MORNING SESSION.

The bonding system for improvement of highways	38
Suggested bonding system	42
Expression of sentiment by counties on the bonding system for road im- provement.....	46
The League of American Wheelmen and the "good roads" law. By LUCIUS H. WASHBURN, of Albany, N. Y.	49
Visit of the convention to the governor	51
Address of Mr. Joseph B. See to Governor Odell.....	51
Reply of Governor Odell to Mr. See	52

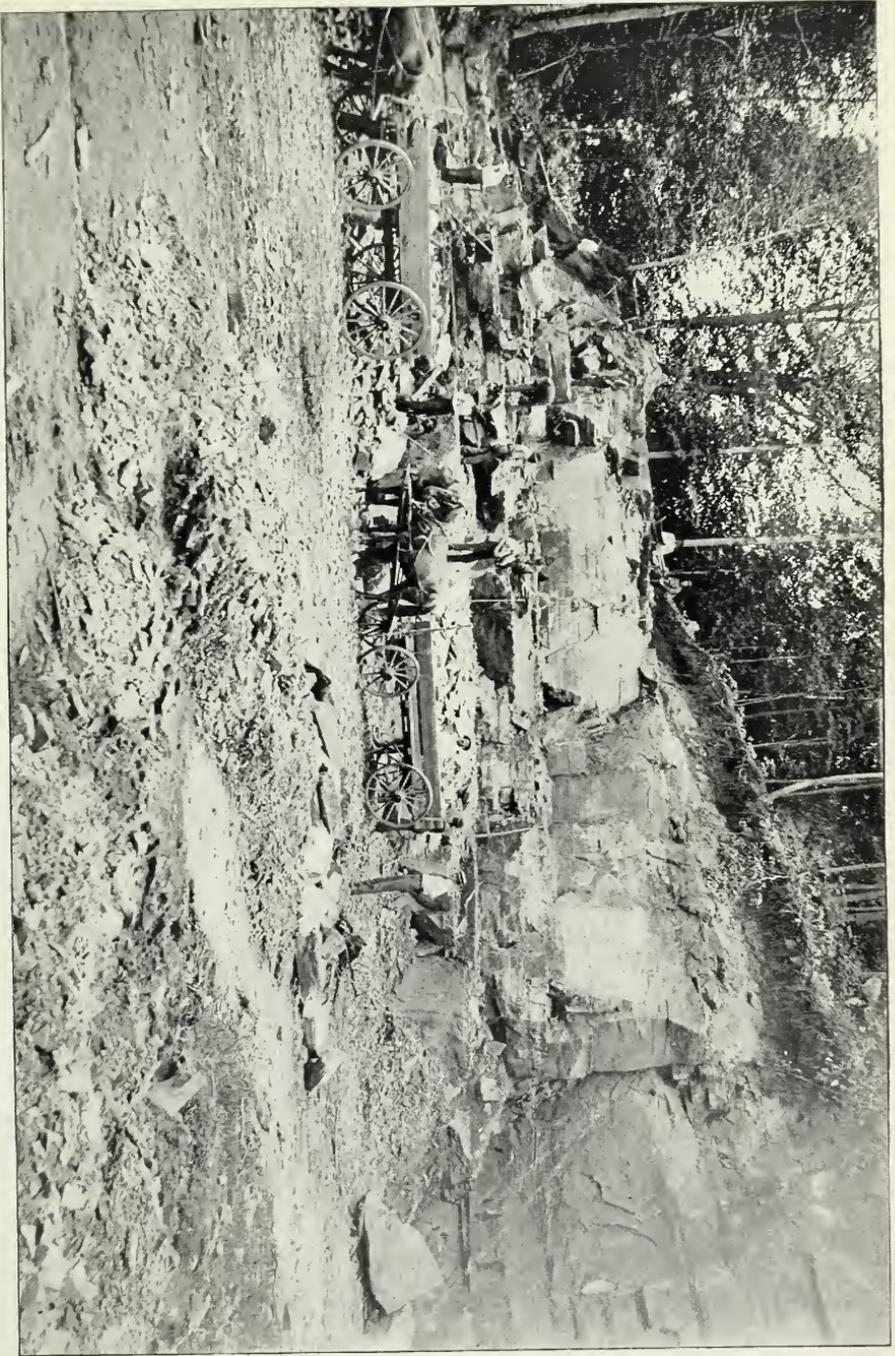
WEDNESDAY, JANUARY 29, 1902—AFTERNOON SESSION.

Wide tires. By FREDERICK M. POWER, of New York	53
The press and good roads. By ARTHUR H. BATTEY, of New York.....	55
Relation between macadam roads and electric street railways. By EDWARD P. NORTH, of New York	59
The relation of common roads to railroads. By LEWIS M. HAUPT, of Phila- delphia, Pa	61
Final proceedings	63

ILLUSTRATIONS.

[The finished thickness of all macadam roadways shown in the illustrations is 6 inches after rolling,
being formed of a 4-inch base and a 2-inch top.]

	Page.
PLATE I. Gloversville and Mayfield Road, Fulton County, N. Y., in progress of improvement in 1901.....	6
II. Unionville and McKeels Corners Road, Westchester County, N. Y., in progress of improvement in 1901.....	8
III. White Plains and Armonk Road, Westchester County, N. Y., in progress of improvement in 1901.....	10
IV. Delaware Turnpike Road, south from Albany, Albany County, N. Y., in progress of improvement in 1901, showing old line and new line.....	14
V. Delaware Turnpike Road, south from Albany, Albany County, N. Y., in progress of improvement in 1901 (new line).....	16
VI. Delaware Turnpike Road, south from Albany, Albany County, N. Y., built on new line in 1901.....	18
VII. Gloversville and Mayfield Road, Fulton County, N. Y., as improved in 1901.....	22
VIII. Ulster and Delaware Road, Ulster County, N. Y., in progress of improvement in 1901.....	26
IX. Ulster and Delaware Road, Ulster County, N. Y., as improved in 1900.....	28
X. Mamaroneck and White Plains Road, Westchester County, N. Y., as improved in 1901.....	32
XI. Elmsford and Eastview Road, Westchester County, N. Y., as in progress of improvement in 1901.....	36
XII. East Avenue Road, eastward from Rochester, Monroe County, N. Y.: Fig. 1.—Repairing ruts made by narrow-tired wagons, October 22, 1901. Fig. 2.—Results of repairs at same place as shown in fig. 1, October 25, 1901.....	38
XIII. Sketch map of New York State, showing possible location of improved roads.....	42



GLOVERSVILLE AND MAYFIELD ROAD, FULTON COUNTY, N. Y., IN PROGRESS OF IMPROVEMENT IN 1901.

Quarry of granite rock 2 miles from center of road. Base, top, and binder of this rock.

PROCEEDINGS OF THE THIRD ANNUAL GOOD ROADS CONVENTION OF THE BOARDS OF SUPERVISORS OF THE STATE OF NEW YORK, HELD AT ALBANY, N. Y., JANUARY 28 AND 29, 1902.

TUESDAY, JANUARY 28, 1902—MORNING SESSION.

Pursuant to the request of Edward A. Bond, State engineer and surveyor of New York, the delegates to the Third Annual Good Roads Convention of the Boards of Supervisors of the State of New York assembled at the city hall in Albany at 10.30 o'clock a. m., January 28, 1902.

The convention was called to order by Mr. Bond, who was unanimously chosen temporary chairman, and who addressed the convention as follows:

ADDRESS OF TEMPORARY CHAIRMAN.

DELEGATES TO THE CONVENTION AND GENTLEMEN: I thank the gentlemen for the honor that is conferred upon me. We have met here this morning at our third annual convention. I realize that I am addressing a convention of the boards of supervisors of the State of New York; that I am addressing as thorough and good a legislative body as can be found in any country. I say this without flattery, because I do think that if there is any one body of legislators that work carefully for the interests of their constituents, and for what they believe to be both economical and for the best interests of their county, it is the boards of supervisors through this State. I see in the faces of this audience an earnestness that I have not seen in our other meetings; I find that the subject of good roads in the State of New York is like snowballs started by boys on the hills—growing larger and larger. To-day we have money voted for half of the cost of roads of the different counties of the State of New York, upward of \$960,000, for which the State of New York has not yet voted its half of the money. We are here at the opening of this convention to discuss all of the merits and demerits of the several laws in our State in regard to the improvement of highways. There is one subject that we all agree on, that is, that the highways in this State should be made better than they

are to-day. The particular method or process for raising the money to make these roads better is yet a question for discussion—and is what we are here for.

It was suggested by some practical men that it would be wise for this convention to invite delegates from the highway commissioners of the State, and in sending out my request to the boards of supervisors this year to name delegates for this convention. I also asked that they name three highway commissioners from each of the counties. I am glad to see that they are well represented. We have a list of 40 counties represented here, covering the number of 110 supervisors and 50 highway commissioners. While all of these persons are not present just at this instant, before the close of the convention I believe they will be present.

I now await the pleasure of the convention.

On motion of Mr. Fitch, of Orleans, the chairman appointed a committee of fifteen on permanent organization, as follows: Messrs. G. W. Fitch, of Orleans; Edward J. Bedell, Albany; Frank D. Lyon, Broome; J. A. Chahoon, Clinton; John Carrier, Franklin; James A. Menzies, Erie; Adam Bickelhaupt, Jefferson; Milton Carter, Lewis; C. G. Schoen, Monroe; James R. Ottman, Oswego; Ira P. Cribb, Ontario; E. E. Dorne, Oneida; James Maloney, Onondaga; E. H. Merritt, St. Lawrence; Olin T. Nye, Schuyler; John L. Mandeville, Tompkins; Chauncey T. Secor, Westchester.

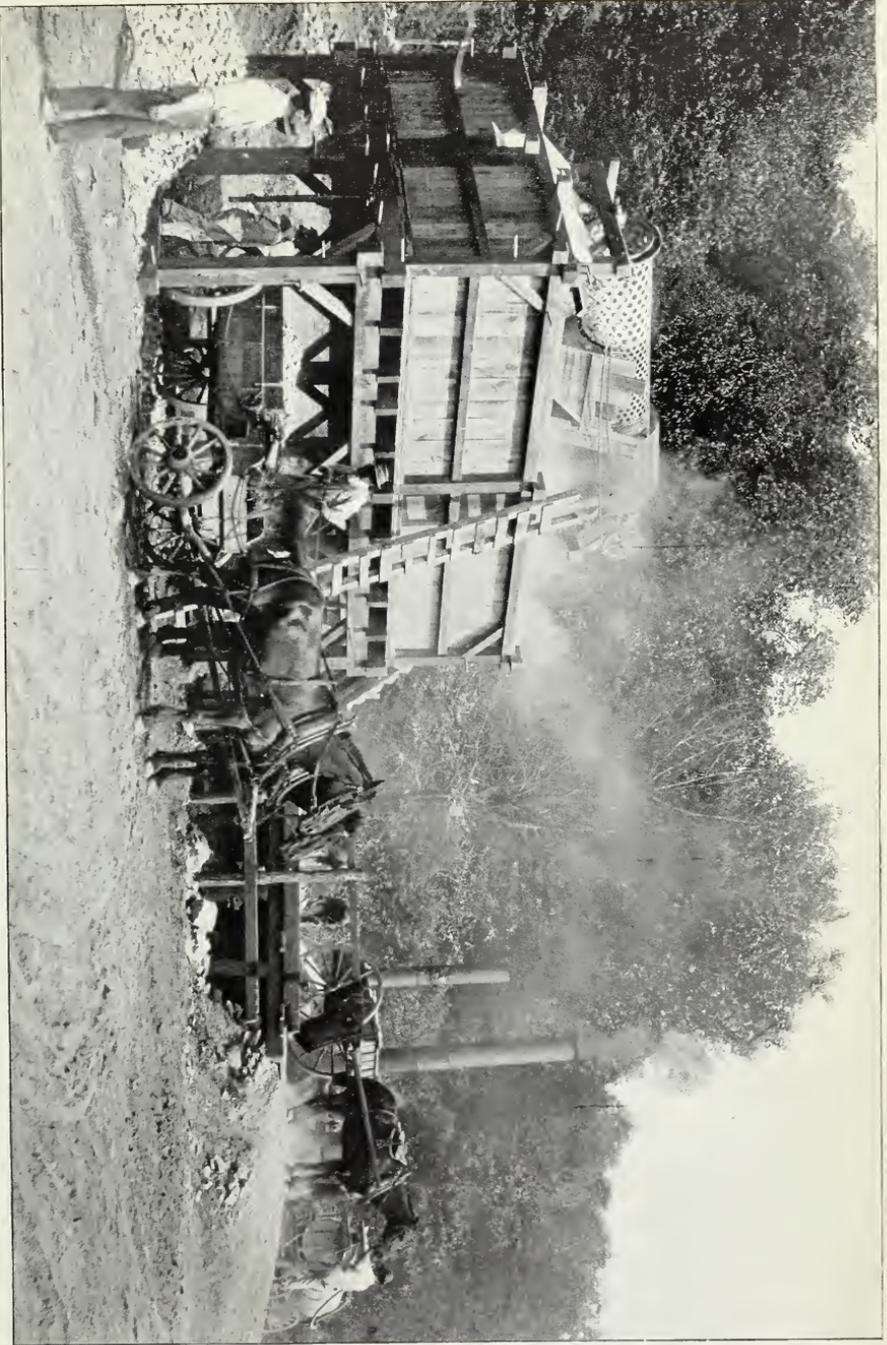
On motion, it was decided to hear the report of the standing committee during the recess of the committee on permanent organization.

At 10.28 the committee on permanent organization withdrew for consultation.

REPORT AND RECOMMENDATIONS OF THE STANDING COMMITTEE.

W. PIERREPONT WHITE, of Oneida County: Gentlemen, your standing committee, appointed at the convention last year, met in Albany about two weeks ago, and after considering the line of work which had already been set out by your convention, we prepared a report for your further consideration, and for the purpose of bringing it more closely to your attention we went to the expense of having a little pamphlet printed, which contains not only our report, but a table copied from a publication issued by State Engineer Bond, and tables showing the condition of the highways under the Higbie-Armstrong act and under the Fuller bill, and also the number of days' labor under the labor system in the State, as shown by Governor Flower's report in his annual message to the legislature in 1893.

The report of the standing committee follows on the next page.



UNIONVILLE AND MCKEELS CORNERS ROAD, WESTCHESTER COUNTY, N. Y., IN PROGRESS OF IMPROVEMENT IN 1901.

Crushing and screening local granitic rock. Base and top of local granitic rock; top bound with equal mixture of screenings of local rock and of Clinton-Point Hudson-River limestone.

To the members of the Supervisors' Highway Convention, held in the city of Albany, January 28 and 29, 1902:

Your committee of two delegates from each judicial district, appointed by you February 15, 1901, would make the following report to you for your action:

HIGBIE-ARMSTRONG ACT, BEING CHAPTER 115 OF THE LAWS OF 1898.

We find that 41 counties in the State have taken advantage of this act. The only counties which have not up to January 1, 1902, asked for its benefit are Allegany, Cattaraugus, Chautauqua, Franklin, Genesee, Hamilton, Kings, Lewis, Niagara, Queens, Richmond, Schoharie, Schuyler, Seneca, Steuben, Tioga, Wayne, Wyoming, and Yates, and we feel certain that these counties will take advantage of the act as soon as their attention is called to the benefits that the other counties are receiving.

RESULTS ACCOMPLISHED IN FOUR YEARS.

In the four years since the Higbie-Armstrong law was passed the following is a summary of the results:

	Miles.
Roads finished	59
Roads in process of construction.....	109
Roads awaiting construction, 20 counties having raised and ready for immediate use \$960,000, their half of the money.....	238
Roads mapped by engineer's department	546
Roads surveyed by engineer's department	704
Roads petitioned for by 41 counties, including roads finished and in process	1,308

We call your attention to the great difference between the roads completed and the roads petitioned for during the past four years. There are 20 counties which have petitioned for 238 miles of road to be built in 1902, and have raised money in their counties amounting to \$960,000 ready for immediate use, and now await the State's appropriation of its equal amount of road money. The State engineer informs us that he has sufficient trained engineers in road building to properly and economically expend \$2,000,000 during the coming year in the building of the 238 miles petitioned for by these 20 counties. We would, therefore, recommend that you pass a resolution asking the State of New York to appropriate \$1,000,000 for the construction of main highways in the State of New York during the ensuing year, as provided by the Higbie-Armstrong act.

MAINTENANCE.

The question of maintaining the roads already built in order to get the greatest wear and economy out of the road material with the least expense to the communities where the roads are built is receiving close attention on the part of the people along the 59 miles of highways now finished.

The experience of the State of Massachusetts is so valuable on the question of maintenance that we quote from page 22 of the report of the Massachusetts Highway Commission for the year 1901, as follows:

Repairs of stone roads should begin the day they are opened to traffic, and the attention they receive the first few months of use determines their usefulness and length of life. Long experience has clearly proved that better results are obtained and at less cost by maintaining the roadway in good condition at all times, by a system of continuous small repairs, rather than by leaving it until it is practically worn out and then thoroughly repairing. The commission has adopted the system of continuous repairs on all State highways. The cost of maintenance is about equally distributed over the roadway and roadside.

One of the chief sources of trouble in the roadway is ravelling, and the consequent loose fragments of stone scattered over the surface. On lightly-traveled ways this ravelling is more likely to occur than on roads with heavy traffic. Various expedients have been tried to prevent it. The only remedy which gives any degree of satisfaction is to sprinkle sand over the surface as often as needed. This coating of sand is a small fraction of an inch in thickness, and is spread over a width of about

8 feet in the center of the roadway. Some of the roads exposed to the wind require treatment several times during each year, while less exposed ones demand but little attention.

Heaps of broken stone are scattered alongside of most of the State roads, to be used, as occasion requires, in filling slight depressions or in cases of emergency.

Experiments convince the commission that a thorough rolling with a steam roller, in the spring, after the frost is out, but before the subgrade is dry, is one of the best means of keeping a stone road in good condition.

In building certain roads it was not deemed wise to import trap, to be used instead of a comparatively soft local stone. Two or three roads of this description have been broken up and resurfaced with trap, in order to reduce the cost of maintenance. In the roads referred to, the smaller fragments were ground up under the traffic, leaving the larger stones projecting through and making a rough surface.

The repairs on the roadside consist of cutting brush and weeds, cleaning waterways and gutters to permit the free flow of water, trimming down or cutting small waterways through shoulders, and filling washouts. On two of the State roads repairs are made by men employed for the purpose, who devote their entire time to it. One of these roads is 11 miles long, and passes through Yarmouth and Dennis and partly through Brewster. The other is in Huntington and Russell, and is 8 miles in length. These men furnish horses, wagons, and tools, and such material found within the location as is suitable for repairs. The State furnishes the broken stone or gravel teamed from off the location. The Yarmouth-Brewster road costs \$600 and the Huntington-Russell road \$480 per year. Under this system the best possible results are obtained and the roads are at all times in good condition. All other roads are cared for by local men working under the direction of a division engineer. As a rule, this last method is neither economical nor satisfactory, and it will be abandoned as rapidly as roads of sufficient length are completed to warrant it.

Dangerous defects are guarded by town officials and reported to the commission. Each State road is viewed by a division engineer at least once in two weeks and its condition noted, and necessary repairs are at once made.

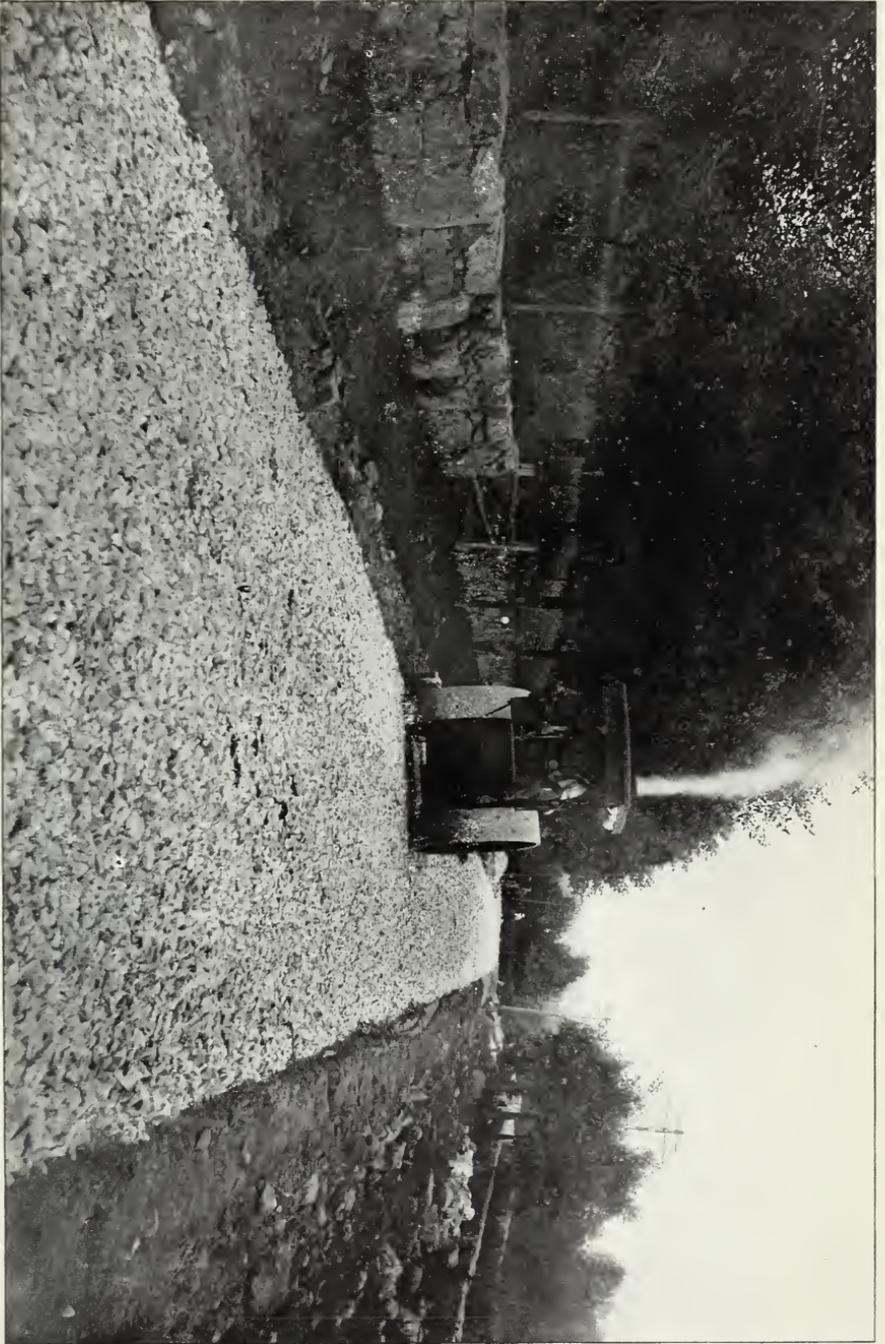
In accordance with chapter 432 of the acts of 1900, the cost of repairs on State roads, not exceeding \$50 per mile, is to be paid by the towns and cities in which the roads are located.

We would recommend, therefore, in order to properly maintain the highways in New York State when they are once built, a resolution on your part calling for the necessary amendment to the Higbie-Armstrong act which will enable the State engineer's department, after the roads are completed, to take care of the repairs and divide the expense of maintenance between the State and the localities benefited.

BOND ISSUE.

It has been called to your committee's attention that if it has already taken four years' work to build 59 miles of road in the State and place 109 miles in course of construction, while 213 miles in 20 counties are compelled to wait the State's pleasure in appropriating an equal amount to match the \$960,000 already raised in those counties, that it will be something over a century before all the roads which are entitled under the Higbie-Armstrong act to receive State aid will come in for their portion under the present method of annual appropriation. Since the law was passed, four years ago, there have been petitions from 41 counties asking for the construction of 1,308 miles of highways. If the State builds 100 miles a year of highways it will take thirteen years to build the highways already petitioned for, and all other counties not now on the petition list must wait until the thirteen years have passed before any roads can be built in their counties under this act. This is not a desirable state of affairs and a solution must be found.

The solution of the difficulty has been suggested in a request to the State to issue State bonds at 2½ per cent to 3 per cent interest, giving each county the benefit of the money raised from the bonds the same as they would be entitled to receive State aid under the annual appropriations in aid of the Higbie-Armstrong act—that is, if a county desired to build roads costing \$100,000 that the State should, in the first instance, pay the entire cost of the road from the money raised on the sale of the bonds. The State would then create a State tax to provide a sinking fund to retire its 50 per cent of the cost of construction and the interest on the money borrowed during the life of the bond. It would assess and levy in the county a tax each year of an amount equal to pay in a like manner the county's 35 per cent of the



WHITE PLAINS AND ARMONK ROAD, WESTCHESTER COUNTY, N. Y., IN PROGRESS OF IMPROVEMENT IN 1901.

Rolling the base course. Base and top of local granitic rock: top bound with equal mixture of screenings of local granitic rock and of Clinton-Point Hudson-River limestone.

cost of construction, and the interest on its share of the money borrowed, and it would assess and have levied against the towns benefited a sum equal to their 15 per cent of the cost of construction and the interest on the money borrowed. In each case the assessment per annum would be sufficient only to create a fund to pay the interest and to retire a portion of the bonds each year during a long period of years. The counties and towns having the benefit of State credit would obtain their money at $2\frac{1}{2}$ to 3 per cent interest instead of 4 or 5 per cent, thus lessening the annual tax rate to them on the interest charge.

Your committee are not prepared to recommend any action on your part under such a proposition, but certainly believe that if the commercial interests of the State of New York are great enough to require the expenditure of \$60,000,000 in the deepening and widening of the Erie Canal to bring the western farmer into keener competition with the farmers of New York State, we most emphatically believe that the State of New York should at the same time expend an equal amount of money in the development of the highways of the State of New York to enable our own farmers to more evenly compete with the keener competition created by the enlargement of the canal.

WIDE TIRES.

Your committee would call your attention to the fact that it is worse than useless to create expensive and valuable highways to have them only cut to pieces by the use of narrow tires as now used for the hauling of heavy loads in this State. When you have got a good thing it costs money and you must take care of it and change your methods to help maintain it. Wide tires are of the greatest value in preserving ordinary dirt roads. We would, therefore, recommend the passage of a State wide-tire law, simple in its requirements, positive in its enforcements, and going into operation two years from this date in order to permit every wagon user to have ample time to adapt its tires to the new law in the interest of road maintenance.

SIGNPOSTS.

We would recommend to your attention the passage of a bill which will make the erection of signposts on the main highways and main market roads compulsory in each county, and the destruction of them a misdemeanor.

MONEY SYSTEM.

In the opinion of your committee, the greatest good can be accomplished for all the highways in the State in the shortest period of time by giving up the old method of working the highway tax by labor and asking our progressive farmers to pay their tax in money. Already under the Fuller law, being chapter 351 of the laws of 1898, there are 25 counties, having 130 towns, which have adopted the money system, and will receive this next June \$90,000 State aid as an inducement to change from the labor system to the money system.

From all of these 130 towns the report comes in that 50 cents on the dollar in cash under intelligent management does two, three, and four times as much good to the roads as a day's labor used to do. There are some natural criticisms which the change has brought about that will need to be regulated by statute later on, but the total benefits to the roads are so marked that we would recommend the passage of a resolution asking that the entire State be placed upon the money system after January 1, 1903, and that all of the towns be entitled, for making the change, to the 25 per cent State aid as now paid to the towns under chapter 351 of the laws of 1898.

In Governor Flower's message to the legislature in 1893 he presented carefully prepared tables showing that the day's labor for the care of the highways in the

State of New York in its 60 counties was approximately 2,000,000 days. Under the money system these 2,000,000 days would be commuted into a cash tax at 50 cents on the dollar, and the counties would raise for road work \$1,000,000 cash, and under the provisions of chapter 351 of the laws of 1898 the State would be called upon to pay 25 per cent of the amount raised in each town back to the towns, which would amount to the State's paying annually \$250,000 to benefit the farmers' highways. In June, 1902, New York State will pay \$90,000 to these towns, and the increased burden to the State on the passage of such an act would amount to the sum of \$160,000. We most earnestly recommend this to your attention, as the change from the labor system to the money system would benefit every road in the entire State and bring to our farming communities better prices for their lands on account of the improved highways.

STATE PRISON LABOR.

Your committee would recommend the passage of a resolution asking the legislature to pass the necessary bills to compel the employment of prison labor in the State prisons in the crushing of stone for the building of State roads.

DELEGATES.

Your committee would recommend the passing of a resolution that at the next meeting in the interest of highways that each delegate hereafter appointed from the boards of supervisors bring with him to the convention as a delegate, with equal privileges with himself, either the highway commissioner of his own town or a highway commissioner from some other town.

STANDING COMMITTEE.

Your committee would recommend that you again appoint a permanent annual committee to represent the boards of supervisors of the State of New York on all matters pertaining to road legislation and the appropriation of money for carrying the same into effect by the appointment of two delegates from each of the eight judicial districts in the State; that these delegates appoint a chairman and executive committee, and that any three of the committee when present at a meeting may act, provided they are unanimous in their action or a majority of those present.

ASSEMBLYMEN AND SENATORS.

We would also recommend that each delegate here, while in Albany, call upon his senator and assemblymen, requesting an appropriation of \$1,000,000 for the Higbie-Armstrong road improvement under the State engineer's department, and also ask him to vote for a bill to make the money system compulsory throughout the State after January 1, 1903, and giving to each town 25 per cent of amount received for road work.

All of which is respectfully submitted.

PROGRESS OF ROAD IMPROVEMENT IN THE STATE OF NEW YORK.

In connection with the above report, the standing committee submitted tables, already alluded to by Mr. White, showing by counties the progress of road improvement in the State of New York, the totals to 1902 being as follows: Under the Higbie-Armstrong act—miles of roads petitioned for, 1,308; miles of roads surveyed, 704.5; miles of roads mapped, 546.9; miles of roads adopted, 407.4; miles of improved

roads completed, 59.5; miles of roads in process of construction, 109.5; miles of roads adopted not under construction, 238.3. Under the money system (Fuller law)—State aid to counties for road improvement in 1898, \$34,517.73; in 1899, \$53,807.55; in 1900, \$67,655.84; in 1901 (estimated), \$90,460.16; State aid due counties, \$219,563; miles of roads approved by boards of supervisors, 231.4; amount appropriated by counties as their one-half of the estimated cost of roads approved, \$960,416.50; total estimated cost of roads as per plan approved by boards of supervisors, \$1,920,833.

FARMS AND VALUE OF FARM PRODUCTS OF NEW YORK STATE.

There was also submitted by the standing committee the following statement from the United States Census for 1890, showing for the State of New York the number of farms, value and tonnage of farm products, and canal tonnage:

Acreage and value of farms, with income from farm products and canal tonnage.

Acreage:	
Total number of farms.....	226, 223
Acres in farms improved.....	16, 389, 380
Acres in farms unimproved.....	5, 572, 182
Total acreage in farms.....	21, 961, 562
Values:	
Value of land, fences, and buildings.....	\$968, 127, 286
Value of implements and machinery.....	46, 659, 465
Value of live stock June 1, 1900.....	124, 523, 865
Total valuation of farm properties.....	1, 139, 310, 616
Income, farm products:	
Estimated value of farm products, 1889.....	161, 593, 009
Canal tonnage:	
Canal tonnage carried, 1900.....	3, 345, 941
Canal tonnage carried, 1901.....	3, 420, 613
Freight going east, 1901.....	2, 276, 199
Freight going west, 1901.....	1, 312, 526
Tonnage, farm products:	
Total annual tonnage, estimated.....	12, 000, 000

In agriculture New York State ranks third among the States of the Union, with an annual farm product worth \$178,000,000. She ranks first in the production of hay, annually raising, approximately, 4,000,000 tons of hay, which in tonnage alone exceeds the entire tonnage carried on the Erie Canal. New York is first in the production of potatoes, raising, approximately, 30,000,000 bushels per annum. First in the production of buckwheat, raising annually 3,000,000 bushels. In barley the State raises about 4,000,000 bushels; of corn, 17,000,000 bushels; of oats, 45,000,000 bushels; of wheat, 7,000,000 bushels; of rye, 3,000,000 bushels. Her product of cheese amounts to 126,000,000 pounds; her product of butter, 40,000,000 pounds; her product of wool, 5,000,000 pounds; her product of beet sugar, 8,000,000 pounds; tobacco, 6,500,000 pounds. One-sixth of all the fruit in the United States is grown in New

York State, and three of her counties control the apple market of the world. Her butter product is equal to one-seventh of the entire product of the United States. Her cheese product is equal to one-third of the entire product of the United States.

[It is estimated that it costs on our present roads and with our present wagons 25 cents to carry a ton one mile.]

Mr. White addressed the convention at some length in explanation of the tables submitted by the committee, and in conclusion said: The question of road improvement in the State of New York is not a fad; it is a question of as great commercial importance as the question of cheapening transportation of the Erie Canal; it is a question of cheapening transportation from our farms to our commercial centers, where we dispose of our goods.

LETTERS INDORSING HIGHWAY IMPROVEMENT BY STATE AID.

Mr. BOND. While we are waiting for the committee on permanent organization we will hear from William Pierson Judson, my deputy, some papers and letters from different persons interested in the good-roads movement.

Mr. JUDSON. I have a letter from Col. William H. Moore, president of the National Good Roads Association, who organized largely the recent highway convention which was held at the Pan-American Exposition at Buffalo, and who we had hoped would be here to-day. He is engaged with others in conducting a "Good Roads train" over the southern part of the country, and he writes this very interesting letter:

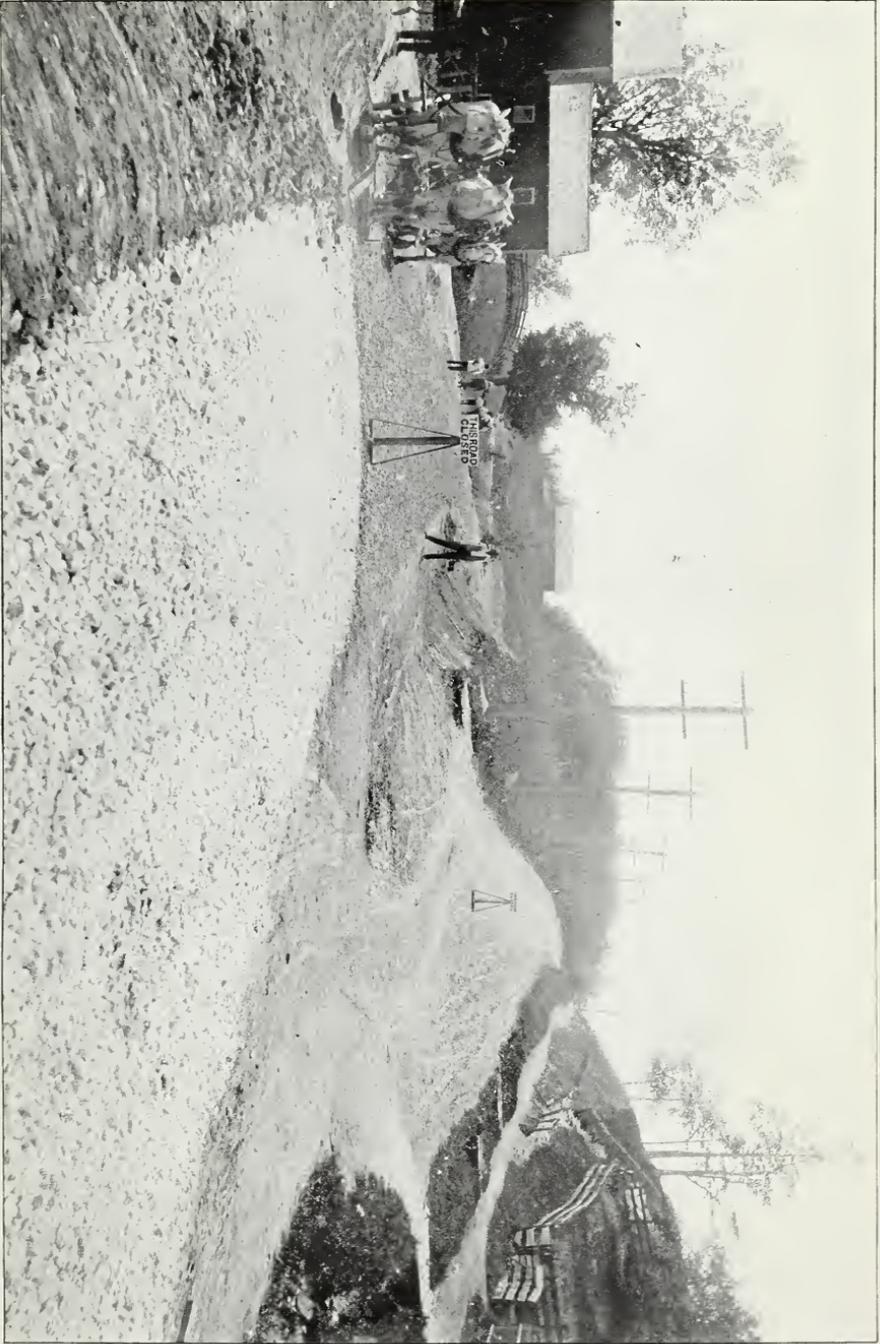
LETTER OF PRESIDENT NATIONAL GOOD ROADS ASSOCIATION.

AUGUSTA, GA., *January 25, 1902.*

MY DEAR MR. BOND: When I received your invitation to be present at the Supervisors' Third Annual Highway Convention at Albany I fully expected to be able to attend, and so advised you. I now find it will be impossible to reach your city in time. * * * Of one thing I am sure, and that is that you are on the right road in advocating and securing State aid to road construction. The examples of New York, New Jersey, and Massachusetts are arousing the deepest interest throughout the South, and in a few years many of the Southern States will adopt your plans. You will have some friction, no doubt, because some counties will not desire to be controlled by the State-aid plan, but will want to break away and build up plans of their own. These intimations were made to us while we were holding the International Good Roads Congress at Buffalo, September 16 to 21. I am fully convinced, however, that the closest band of union that can be promulgated, binding the State and the interests of the remotest counties in one general plan which will be systematic and economical in road construction, is the surest and most effective way of securing better roads.

Your engineering force at the capital, and placing an engineer in each county, must create system. In a very short time these plans will naturally educate the taxpayers as to the cheapest and best forms of common-road improvement.

I find in visiting a large number of States each year that inefficient road officials are the chief cause of the wretched condition of the roads throughout the country. * * * In one great step, I find that New York and many other Northern States are behind some of the Southern States in the use of convict labor upon the public roads.



DELAWARE TURNPIKE ROAD, SOUTH FROM ALBANY, ALBANY COUNTY, N. Y., IN PROGRESS OF IMPROVEMENT IN 1901, SHOWING OLD LINE AND NEW LINE.

New line on left; old line on right. Base of Stony-Point Hudson-River limestone; top of Rockland-Lake Hudson-River trap rock, bound with Bethlehem,

Albany County, limestone screenings.

North Carolina, with convicts, is building roads macadamized 6 to 8 inches deep, 15 to 20 feet wide, at a cost of \$1,100 to \$1,700 per mile. The same grade of roads, no better constructed, are costing from \$3,000 to \$5,000 per mile in Northern States. Write to Mr. P. H. Hanes, Winston-Salem, N. C., for detail facts along these lines. The citizens of many States, as well as many of their lawmakers, through false sympathy, and a lack of real knowledge as to the facts, have temporized too long with the convict problem. No able-bodied convict, tramp, or vagrant should be housed in prisons at public expense and brought in contact with the honest wage-earners of the nation. The labor of convicts and other able-bodied defective classes should be used to build roads, improve streets, sewerage, dredging streams, and upon other public works. Has your convention taken action upon this question?

I regret I can not be with you. Wishing your meeting the success it deserves, and with great respect, I am,

Sincerely,

W. H. MOORE,

President National Good Roads Association, United States.

HON. EDWARD A. BOND,

State Engineer and Surveyor, Albany, N. Y.

The above was followed by a letter from Hon. James H. Macdonald, highway commissioner of the State of Connecticut.

Mr. JUDSON. The next letter is by ex-Senator Martin Dodge, who is Director of the Office of Public Road Inquiries of the U. S. Department of Agriculture at Washington, and who is prevented from being here by the fact that he is conducting, through the Southern States, a "Good Roads train," which has been giving object lessons to the people of all parts of the country:

LETTER OF DIRECTOR OF OFFICE OF PUBLIC ROAD INQUIRIES, U. S. DEPARTMENT OF AGRICULTURE.

AUGUSTA, GA., *January 25, 1902.*

DEAR SIR: I have your letter of January 18, requesting me to be present at the Supervisors' Highway Convention, January 28 and 29, and participate in your deliberations. I regret exceedingly that I shall not be able to comply with your request owing to other and previous engagements. But I am very glad to assure you, and through you the delegates to the convention, of my hearty sympathy with the great work in which you are engaged, and appreciate very highly the progress which you are making. It may be interesting for you to know that many people from many other States in the Union are looking to your example with a view of imitating it.

It has been my privilege to participate in an interstate convention of Georgia and South Carolina, just held in Augusta, Ga., and lasting two days, in which the road problem has been discussed from almost every point of view by many able and distinguished gentlemen, and I am sure you will be pleased to know the conclusions which they reached, as expressed in the resolutions which were unanimously adopted by the convention, and from which I quote as follows:

(1) *Resolved*, That this Good Roads Congress now assembled, composed of delegates from the States of Georgia and South Carolina, is in our judgment one of the most progressive industrial steps ever inaugurated by the citizens of the two States, and we believe will ultimately result in improving the roads in all sections of Georgia and South Carolina.

(13) *Resolved*, That experience has demonstrated that the greatest progress for good roads has been made in the States where the system of State cooperation has prevailed under the direction and control of an engineering department; and that we recommend this plan to be adopted by our States as far as the same may be applicable to their conditions.

(15) That this congress indorses the use of convict labor where practicable in the work on public roads or in the preparation of materials therefor, thereby taking the convicts out of the competition with honest labor.

I notice everywhere I go a desire and tendency to abolish the old system of statute labor which has prevailed to such an extent heretofore, and to substitute in lieu thereof a money tax. I also notice that no real progress is made in the substantial improvement of the highways unless they have one of three things—a general fund of money provided by the county; or an application of the prison labor to working the highways in a continuous and methodical manner, or State aid, as is so well exemplified in your own State.

It is encouraging to note in this connection that the Industrial Commission which has been sitting at Washington, D. C., for the past three years investigating the industrial condition that prevails throughout the country, has come to the conclusion, and has recommended in its report which is just submitted, that the various States should imitate the example of New Jersey and New York and give direct aid in the construction and maintenance of highways. The logic of events is leading to the conclusion that State aid or Government aid is essential to the success of this great and important cause, and there seems to be no good reason why the General Government itself should not be more liberal than heretofore in aiding the cause. I have lately received a communication from Hon. W. Rees Jeffreys, of London, England, in which he calls attention to the wasteful system of highway administration existing at the present time in England and Wales. It is interesting to note that a country so advanced in its system of highways should still be laboring under some of the difficulties of which we complain. I quote the following from an address by the Road Improvement Association, of London, on the reform of the existing system of highway administration, to the president of the local government board:

(3) Short of the old parochial and turnpike system, which existed at the commencement of the nineteenth century, no more expensive system of road maintenance than that in operation in England and Wales to-day could be devised. The control of the highways of this country is divided between no less than 1,879 different authorities, whose limited jurisdictions and inadequate powers prevent the exercise of any effective control over the development of urban districts. The work that they perform could be carried out far more efficiently and far more cheaply by less than one-tenth of that number.

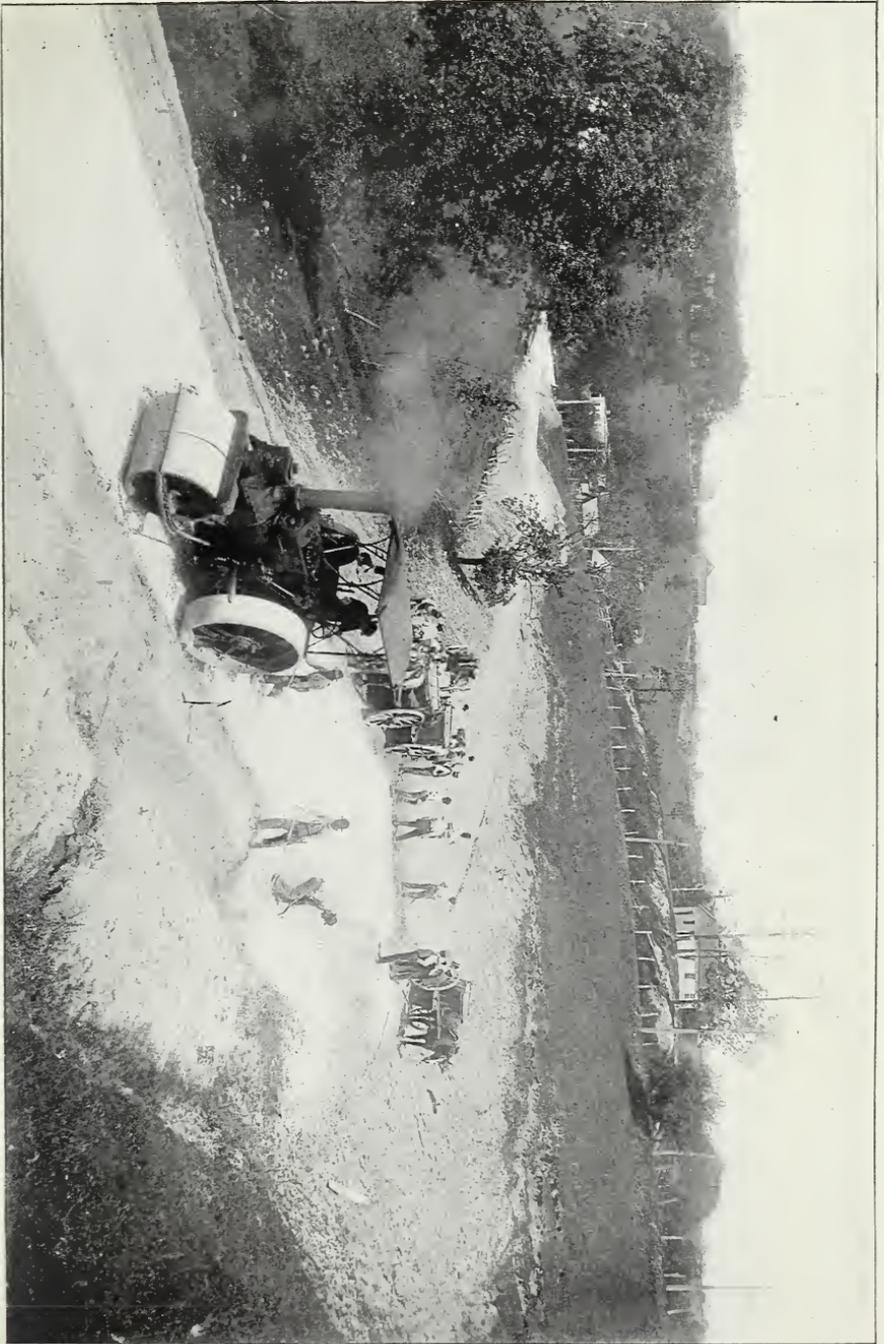
(4) That this would necessarily be the case is apparent when it is recalled that under the existing system each one of these 1,879 authorities is required to engage a surveyor and an independent staff to maintain a separate establishment for highway purposes, and to enter into separate contracts for the supply of material, etc. Moreover, the smallness of the area under the jurisdiction of each authority renders the carrying out of any considerable scheme of road construction an impossibility.

(5) In Lancashire alone, for example, there are no less than 151 highway authorities exercising jurisdiction over areas which have been mapped out in an arbitrary way without any regard as to what would constitute an efficient unit for the purposes of highway administration. There is no doubt that there would be a very considerable saving, as well as a great increase of efficiency, if one highway authority were constituted for all the important roads in the ancient or geographical county, i. e., including those in the county boroughs. The establishment expenses would be greatly reduced, material could be purchased more cheaply, and the highway authority would be able to secure the services of a small and highly skilled staff to direct roadmen of a class superior to those at present employed.

(6) As regards the management of the district or ordinary highways, a number of adjoining rural and urban districts could be grouped together so that the financial resources of each district would be sufficient to enable them to pay the salary of a competent officer as surveyor and to purchase a steam roller. The district surveyors should, as in Scotland, be subject to the reasonable orders of the county surveyor. The joint committee of the county councils and the city borough should also have general powers of supervision over the maintenance of the district or ordinary highways, and should have power to determine and vary the direction of all new roads and streets.

A system devised on these lines would result in uniformity and economy of administration, and would give the large towns a more influential voice in the developments of the urban and rural districts surrounding them. It would also equalize the highway rate and, by causing the urban centers to contribute to the cost of the rural highways, would tend to relieve the pressure of the highway rate in rural districts.

Until highway authorities are created having jurisdiction over large areas, the roads in this country will continue to be maintained at a cost quite out of proportion to the results obtained. The arbitrary way in which a single road is divided for the purposes of maintenance can perhaps be best realized when it is pointed out that the main road from the city of London to Uxbridge (the old Oxford road) in the course of 20 miles, passes through the areas of no less than twelve highway authorities, and the



DELAWARE TURNPIKE ROAD, SOUTH FROM ALBANY, ALBANY COUNTY, N. Y., IN PROGRESS OF IMPROVEMENT IN 1901 (NEW LINE).
Base of Stony-Twint Hudson-River limestone; top of Rockland-Lake Hudson-River trap rock, bound with Brechtelien, Albany County, Jimestone screenings.

main Bath road, from Piccadilly Circus to Slough, passes in the first 20 miles of its course through the jurisdiction of no less than ten authorities. Each authority repairs its portion of the road when it likes, and with what material it chooses, without reference to the adjoining authority.

It is this arbitrary and unnecessary division of one road among so many authorities which is the prime cause of inefficiency and waste.

Whether, however, the number of local highway authorities is reduced or not, the need for a central highway department will remain. In fact, if the administrative difficulties in the way of a considerable reduction in the local authorities should prove insuperable, the more urgent will be the need for the immediate establishment of a central department.

If your legislature should appropriate the sum of \$961,000, as recommended by you for State aid in road building in New York, you would be able to give such a demonstration of the wisdom and success of this plan as has never been given in America. Your example would surely be imitated by most of the States in the Union in due course of time, for "a city set on a hill can not be hid."

Thanking you for your kind invitation and earnest work, and wishing you continued success, I remain,

Very truly, yours,

MARTIN DODGE,

*Director of the Office of Public Road Inquiries,
U. S. Department of Agriculture, Washington, D. C.*

HON. EDWARD A. BOND,

State Engineer and Surveyor, Albany, N. Y.

WM. PIERSON JUDSON, of Oswego, deputy State engineer of New York: It is well known to members of this convention that our neighboring States of Massachusetts, Connecticut, and New Jersey preceded New York State in the work of highway construction by State aid. Recognizing this fact, it has from the first been the policy of State Engineer Bond and of myself, as his deputy, to establish and maintain cordial personal relations with the officials of these States, and thus to receive from them full advantage of the experience which they have acquired at the expense of their several States. You will remember the valuable address made a year ago to this convention by Hon. William E. McClintock, chairman of the Massachusetts commission. In this way I am a member of the Massachusetts Highway Association, which is made up of the road builders of that State, from whose meetings I have obtained many valuable points regarding difficult features of road construction. Hon. Charles W. Ross, former highway commissioner of Massachusetts, is a member of this association, and is now the street commissioner of the city of Newton, which differs from any city in New York in that it is composed of some fifteen villages distributed over a large area and united by lines of the highest class of macadam roads, of which the city thus contains some 60 miles. As highway commissioner of Massachusetts, and as commissioner for the city of Newton, Mr. Ross has probably had as large an experience in the building of macadam roads as any man in the United States, and there can be no better practical lesson in this art than an examination of his work in actual use. He is unable to be present in person, but has prepared the paper on the next page, "A few practical suggestions on road building," which this convention will be fortunate in hearing, and which will be published as a part of its proceedings:

A FEW PRACTICAL SUGGESTIONS ON ROAD BUILDING.

By CHARLES W. ROSS,

Former State Highway Commissioner of Massachusetts and present Street Commissioner of Newton, Mass.

I will endeavor to tell you, in a few words, what has been accomplished in the way of road building in Massachusetts.

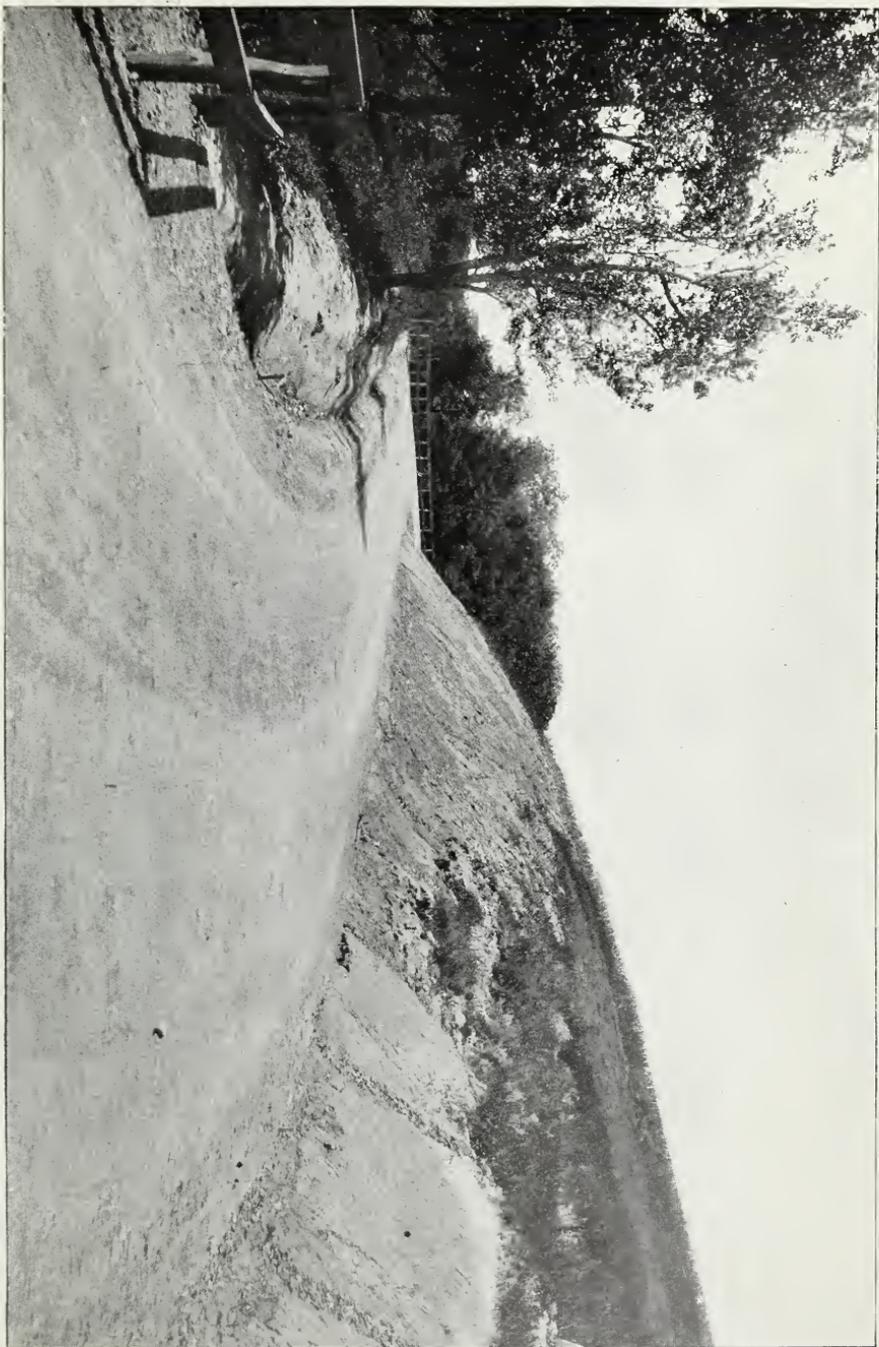
In the first place we have a State highway commission, which was one of the first commissions of this kind established in the country, and this commission has done an immense amount of good—building roads and giving advice to the cities and towns in all parts of the State. The representatives from any part of the State can feel perfectly free to go to the commission at any time and ask its advice in regard to work that is being done in the different localities.

We also have a highway association, which is composed largely of persons actively engaged in road building—mostly street commissioners and highway surveyors. At the present time there are about two hundred members, and we meet from time to time and discuss the subject of road building, and listen to papers which are read. (The constitution of this association is given at the end of this paper.)

The principal work of the association has been to try to create an interest in the different parts of the State as to the kinds of material to be used, the various machines which can be obtained to aid the work, and also to show how to get the best form of construction at the least possible cost; perhaps it is not the least cost in dollars and cents at the beginning, but what would seem to be the most permanent investment. The conditions in different sections of the State vary so largely that it is impossible to have a fixed rule, but individual cases should be studied.

The road builders of the entire State are so much interested in this work that they are very anxious to consult with one another, and when a young man is appointed street commissioner who has had but little experience in that line, he is always welcome to come to our meetings and ask for such information as he desires from the older and more experienced members. This information can not be obtained from books, and is merely practical experience. A man may have a technical education and yet be entirely disqualified to judge the proper kinds of material to be used in a first-class gravel or macadam road. This information can only be obtained from those who have had actual experience in this line and have profited by failings of their own as well as others.

The one great mistake is to change the superintendent of streets at each annual election. I have heard it said by men traveling through different sections of the State that they can invariably tell when they get into a town where the superintendent of streets is changed annually. If a man holds his position for a number of years he is sure to build better roads. It is a fact that a man who is elected for only one year can not do his full duty. It does not seem that it should be so, but nevertheless the fact can not be denied that a man who expects to be elected at the next annual meeting is obliged to submit to different tactics and take advice from those who are always so ready to give it, and in many cases know but little about constructing a road. If he tries to do his duty regardless of the advice given him by inexperienced people, he often fails to be reelected. In a great many of the cities in our State it has been made a part of the city charter that the heads of departments should hold office during good behavior, or until such time as they prove to be disqualified for the position. This seems to be an incentive for a man to take the position and thoroughly educate himself to do the best work possible, the same as he would if employed by a corporation where he expects to be employed as long as he can show that he is giving an equivalent for every dollar intrusted to him. This is



DELAWARE TURNPIKE ROAD, SOUTH FROM ALBANY, ALBANY COUNTY, N. Y., BUILT ON NEW LINE IN 1901.

Base of Stony-Point Hudson-River limestone; top of Rockland-Lake Hudson-River trap rock, bound with Bethlehem, Albany County, limestone screenings. Showing subdrainage of clay hillside.

the only method by which good results can be obtained, and the sooner the people in this country get their minds down to the fact that a street commissioner should be held in office as long as he gives good results, the better it will be for the public in general.

I am convinced that in some places in Massachusetts money has been practically thrown away simply because the road builder lacked information as how to obtain the best results under the existing circumstances. I do not need to go into details, as anyone who is at all familiar with the management of municipal affairs can readily see how these mistakes have been brought about.

I believe that at the present time there is more demand for good, practical road builders than for men in any other line of business. A person who will try to put his mind to the work and obtain the best results for the one who employs him will certainly be sought for.

I am not sure that an association similar to our highway association would be necessary in New York, New Jersey, or several other States, as I know that under the direction of the State engineers and their able assistants not only the engineering but the practical side of the work is studied very carefully, and every effort is being made by them to hold public meetings and give the public the benefit of their experience; but in some States, where they depend so much on the local engineers, they have not, up to the present time, felt like holding public meetings and public discussions, which are so necessary in order to obtain the best results. The more the street commissioner and the engineer consult in regard to these matters the better the results, and I certainly think that an association which will combine both the engineering and practical experience is something that should be sought for.

In our State (Massachusetts) the Boston Society of Engineers is always ready to give information in regard to matters of drainage, cross sections, lines, grades, etc., and I think this has been brought about largely through the efforts of the highway association, combined with the friendly feeling existing between the two societies. When a local superintendent of streets feels that he can get along without the advice of the engineer, and sets himself up as authority, notwithstanding the technical knowledge which the engineer possesses, he makes a mistake not only for himself but for the city which he serves.

The style of the road that is being built in different sections of Massachusetts at the present time is a very different type from that which was built ten or more years ago. For instance, in many places we find from practical experience that from 4 to 6 inches of macadam put on a good gravel foundation will give as good results as could possibly be obtained by putting on 8 or 10 inches, which was formerly the idea. It was evident that the large cost of building macadam roads could not be continued, and it was found by experience that something of a cheaper and yet a durable nature must be obtained. For instance, if a side street in a city has a good gravel foundation it can be covered with from 2 to 3 inches of crushed stone, put on in layers and thoroughly rolled, and give a good result. In many cases such a road is just as satisfactory as one covered with from 4 to 6 inches. When the amount annually appropriated by a city or town is small, it is a hard problem to solve—to know what to do to give the best results with the least amount of expenditure.

It has been thought by some that a good macadam road should last for all time, if properly built, but it does not seem possible that any character of road construction will last for a stated number of years, as the conditions are so variable. Here in New England we are submitted to such severe changes in the weather that what might apply to other States would not apply to ours. The heavy storms which come so often do an immense amount of damage to our roads, and I can safely say that one heavy shower which we had last summer damaged the streets of the city of Newton to such an extent that it would have cost at least \$20,000 to put them in the condition that they were in before the storm. As these storms are so liable to occur,

it has taught us to look for something more durable and something that will stand the severe storms of the spring and summer. There have been a great many experiments made in regard to a new mixture of concrete or bituminous macadam, and roads of this material are being built in many parts of the country at the present time.

My experience leads me to believe that in a short time many of our streets will be covered with a coating of bituminous macadam, which will insure them against the action of the weather, and they will not be affected either by freezing or thawing.

While the loss of fine material from the road after a shower is very great, there is also the additional expense of cleaning out the drains and catch basins that have been filled with this material, which is washed from the surface of the streets. It clogs the drains and goes from there into the small streams that lead to the river, and we are obliged to keep these cleaned at a great annual expense. If these roads could be surfaced with a less expensive material than asphalt, and yet give a smooth and lasting surface that would not be as slippery in the winter, or even in the summer when it is wet, and would insure it against the action of the high winds that sweep so much of the fine material away during certain seasons of the year, it seems to me that the experiment would be well worth trying. I hope before many years to see a great improvement in this direction.

CONSTITUTION OF THE MASSACHUSETTS HIGHWAY ASSOCIATION.

PREAMBLE.—The members of the Massachusetts Highway Association, in accordance with their charter, and for the more effectual execution of the design of their association, establish and ordain the following constitution and by-laws for the government of the said association:

ARTICLE 1 (*Name and objects*).—The name of the association shall be the Massachusetts Highway Association. The object of this association shall be the acquirement and dissemination of knowledge, both theoretical and practical, relating to the construction and maintenance of highways, by social intercourse and friendly interchange of knowledge between its members.

ARTICLE 2 (*Membership*).—The association shall consist of active, honorary, and associate members. Persons professionally actively engaged in laying out or supervising the construction and maintenance of highway work shall be eligible as active members.

Honorary members shall consist of persons who have furthered the interest of this association, either by their acts or by their writings, and shall be deemed worthy of this association.

They shall have no vote on any subject in regard to the government of the association, neither shall they be subject to fees, dues, or assessments.

Other persons interested in the object of the association, and desirous of being connected with it, shall be eligible as associates.

They shall have all rights of members except the privilege of voting.

Admissions into or dismissal from the association shall be in accordance with such rules as shall be prescribed by the by-laws.

ARTICLE 3 (*Officers*).—The officers of this association shall consist of a president, two vice-presidents, a secretary, a treasurer, and four directors. They shall be elected by letter ballot at the annual meeting, and shall assume their duties at the close of said meeting, and shall hold office until their successors are duly chosen.

The president, secretary, and treasurer shall be elected for one year; the vice-presidents for two years—one vice-president and two directors to be elected annually.

The officers shall constitute the board of government, which shall have the general management of the affairs of the association.

The election of officers shall be conducted as prescribed by the by-laws.

ARTICLE 4 (*Meetings, quorum*).—Meetings of the association shall be held at such times as may be prescribed by the by-laws.

The regular meeting in February shall be the annual meeting for the election of officers and for the hearing of the annual reports.

Ten members shall constitute a quorum for the transaction of business.

ARTICLE 5 (*Amendments, indorsements*).—Any amendment to this constitution may be made by a two-thirds vote of the members present and voting, cast in favor of such amendment in its final form, due notice of such amendment having been sent to each member with the notice of the meeting.

No proposition which includes the association's indorsement shall be passed, except as in the same manner as prescribed for amendments to the constitution.

PERMANENT ORGANIZATION.

At 11.20 o'clock the committee on permanent organization reported as follows:

Permanent chairman.—William F. O'Niel, Franklin.

Secretary.—John J. Irving, Broome.

Vice-presidents.—William C. Newell, Onondaga; James A. Woodard, Erie; Charles Chamberlain, Chemung; Avery A. Donalds, Orleans; A. Smith Hopkins, Westchester; C. W. Gledden, Orleans.

Committee on business.—Frank Z. Wilcox, Onondaga; Thomas W. Scully, Erie; W. M. Warner, Ontario; D. B. King, Broome; John W. Thompson, Niagara; William B. Sears, Tompkins.

Committee on resolutions.—Joseph B. See, Westchester; E. P. La Freviere, Onondaga; Thomas Williams, jr., Herkimer; H. S. Ostrander, Orleans; Charles S. Farr, Seneca; Edward J. Bedell, Albany.

Committee on legislation.—W. Pierrepont White, Oneida; Frank Z. Wilcox, Onondaga; Frank F. Herrick, Cayuga; Joseph H. Brownell, Broome; Fred Howland, Jefferson; George C. Diehl, Erie; Edward P. Kear, Westchester; De Witt C. Becker, Monroe.

Committee to wait on governor.—Edward A. Bond; Joseph B. See, Westchester; W. Pierrepont White, Oneida; James A. Menzies, Erie; Frederick M. Power, Onondaga; G. W. Fitch, Orleans; C. H. Smith, Schuyler; Frank D. Lyon, Broome; Seth Mather, Jefferson; Charles R. Matthews, Franklin; Alphonso Collins, Monroe; Charles M. Thompson, Ontario; J. R. Ottman, Oswego; J. A. Chahoon, Clinton.

ADDRESS OF THE PERMANENT CHAIRMAN.

WILLIAM F. O'NIEL, of Franklin, permanent chairman, addressed the convention as follows:

GENTLEMEN OF THE SUPERVISORS' CONVENTION: I thank you for the honor of presiding over your deliberations. I am somewhat rusty in matters of parliamentary procedure, and almost entirely unacquainted with the membership of this convention. These two things, no doubt, will detract to some extent from my chairmanship. I accept the position, however, relying on your kind forbearance and your cooperation to make the convention a success.

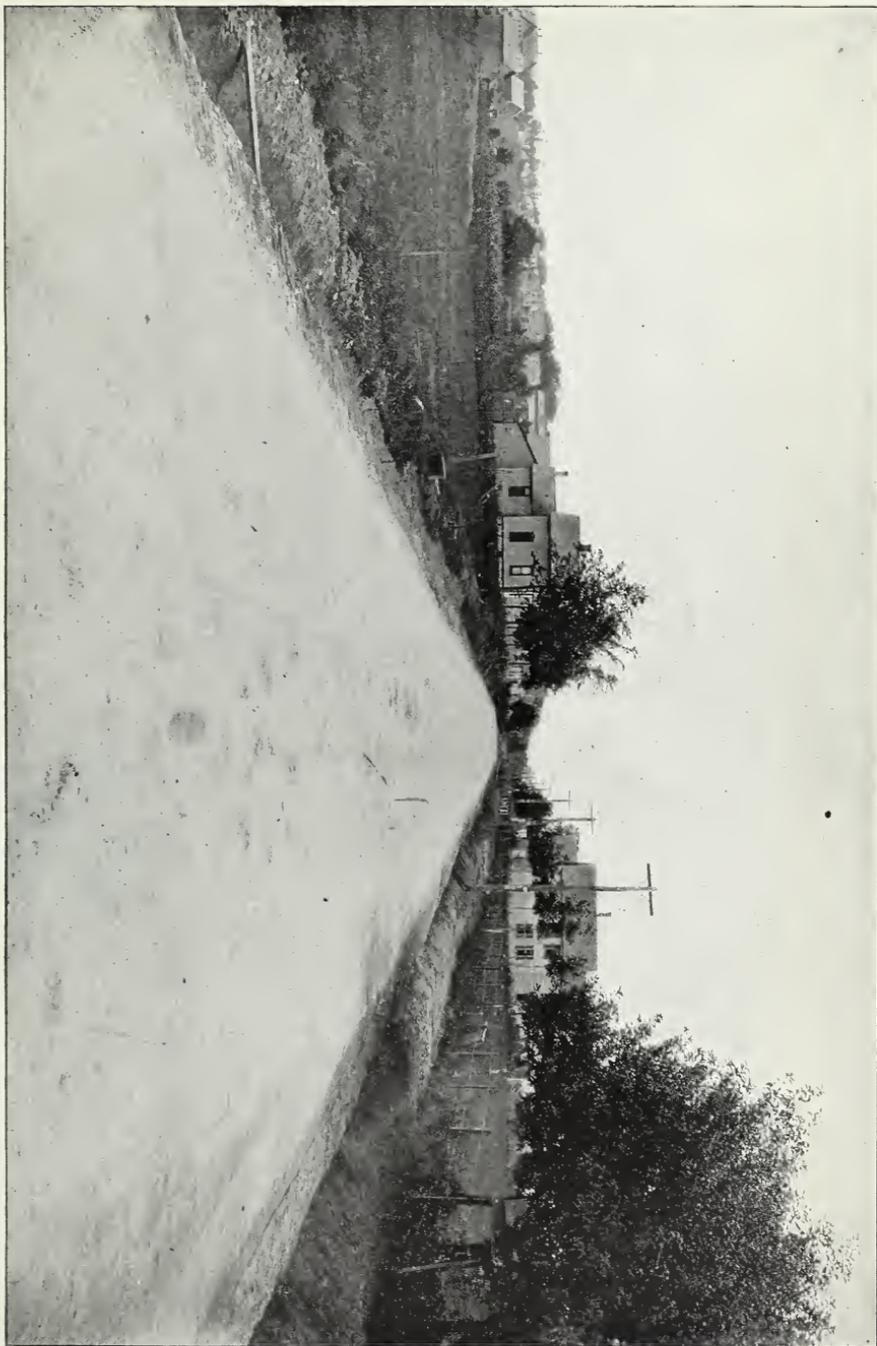
I have had no experience in the matter of construction of highways; I had no expectation of being in this place, and I shall, therefore, not assume to make any extended address. We are here to-day to contribute something—to do what we can to advance the cause of highway improvement. While we may discuss the details of road construction, while we may talk about materials, we may touch somewhat the cost; we may talk about engineering features, we may talk about details of legislation; in my opinion these details will care for themselves during the future progress of the movement. The question before this convention, the question before the friends of highway improvement, is, How can we get good roads and how can we get them now? I, for one, during my lifetime, want to ride in this State over good roads in every town, every county, and every school district. It seems to me

there are two primary essentials—two things to which the friends of good roads should direct their attention. The first is the building up of public sentiment. How can we get the people of the State to come in a mass to support this movement? Gentlemen, when the people of the State of New York, when the people of every city, every village, every hamlet, every country crossroad come to want good roads—come to really and earnestly and insistently want good roads, then good roads will come within our lifetime, within the next quarter of a century. It seems to me that is the foremost thing; that is, the first thing. Every friend of good roads should seek to devise some method, to formulate some plan; every member of this convention and every member of every good roads association and every friend of good roads everywhere should constitute himself a missionary to help support this work. One other thing, second in order, perhaps, but not less important: The chief characteristic of the times in which we live is the development and application of the principle of organization to the management of vast business enterprises; obliteration of the individual, or rather the merging of the individual in a system, concentration, centralization—concentration of brains and money directed to a given purpose. What kind of a railroad would the New York Central be to-day if it were managed all through this State by the overseer of the highways of each town? We would be running on the iron straps that were laid on the wooden rails of the first railway. We will never have a widespread, extensive, permanent improvement of the roads of this State until the present inefficient system (misnamed system)—rather a lack of system—is swept away, and in its place we have an organization, a central authority managing the highway system, both the construction and the maintenance, as New York State manages its educational system, as the United States Government manages the post-office, reaching down through this organization into every school district and every town.

Now, gentlemen, until we get these two things, until we get the people of this State in a mass behind this movement, until we have a systematic organization to carry it out, we never will have good roads. In my judgment these are the two primary essentials for success.

John J. Irving, of Broome, permanent secretary, said it was not customary for secretaries to make speeches, and he would not depart from the rule, but he would take the liberty, in thanking the convention for the honor conferred upon him, of concurring in the sentiments expressed by the chairman.

On motion of Frank D. Lyon, of Broome, Edward A. Bond, State engineer of New York, and William Pierson Judson, deputy State engineer of New York, were made members of the convention, with all the privileges of the floor.



GLOVERVILLE AND MAYFIELD ROAD, FULTON COUNTY, N. Y., AS IMPROVED IN 1901.

Base, top, and screenings crushed from local granitic rock.

DELEGATES TO THE CONVENTION.

On motion of James A. Menzies, of Erie, the secretary called the roll of the convention, and following is a list of the delegates, the persons that upon motion were made delegates, and also the names handed the secretary during the convention:

REGULAR DELEGATES.

Albany County.—Peter Walker, Dunnsville; Dr. Edward J. Bedell, Selkirk; Ralph A. Gove, Loudonville; Earnest Williamson, West Township; John Flansbury, Voorheesville; Jared Haker, Coeymans.

Broome County.—David B. King, W. H. Slack, Castle Creek; Charles Van Amburgh, Port Crane; Frank D. Lyon, John J. Irving, Binghamton; Joseph H. Brownell, Windsor; Henry Collington, B. B. Badger, Onaquaga.

Cattaraugus County.—H. C. Holcomb, Portville.

Cayuga County.—Webb J. Greenfield, Moravia; William B. Reed, Sterling Center; Frank F. Herrick, Owasco.

Chemung County.—Charles Chamberlain, C. D. Shapper, F. W. Meddaugh, Elmira.

Chenango County.—W. B. Leach, Norwich; George L. Page, Greene; Isaac Dalrymple, Otselec; Charles G. Brooks, Mount Upton.

Clinton County.—J. A. Chahoon, Ausable Forks; John B. Trombly, Altona; Peter A. Fesett, Sciota.

Columbia County.—J. C. Rightmyer, Michael Arkison, Hudson; Lewis Furgew, Gallatin.

Cortland County.—A. R. Rowe, McGraw; N. F. Webb, W. A. Smith, Cortland.

Dutchess County.—D. V. Moore, Clove Valley; R. W. Rives, New Hamburg; C. J. Rockefeller, Madalin.

Erie County.—George Kelver, William H. Conboy, James A. Woodard, James A. Menzies, Thomas W. Scully, George C. Diehl, Byron E. Gibson, Buffalo.

Franklin County.—William F. O'Neil, St. Regis Falls; John Carrier, Saranac Lake; Charles R. Matthews, Bombay.

Fulton County.—P. M. Simmons, Johnstown; S. Elmore Burton, Gloversville; John A. Chalmers, Perth.

Genesee County.—David Clark, Corfu.

Greene County.—M. O'Hara, Tannersville; H. R. Steele, Ashland; D. G. Greene, Cossackie; Elmer Krieger, Prattsville; Henry I. Van Loon, Athens; Harmon E. Dibble, Platt Clove; Henry Brownell, Urlton; William Akins, Medway; George W. Winnans, Kiskatom; Daniel Kirk, Spruceton.

Herkimer County.—L. B. Wheeler, West Winfield; Thomas Williams, jr., Henry Wainman, Jordanville; John Fields, Middleville; H. H. Hull, Ilion; S. M. Davis, Frankfort; Frank O'Roak, Millers Mills; H. D. Hiller, Salisbury Center; J. R. Jones, Newport.

Jefferson County.—Fred Howland, Black River; Adam Bickelhaupt, Redwood; Seth Mather, Lafargeville.

Lewis County.—Milton Carter, Harrisville; Charles T. Kilham, Copenhagen; Charles H. Steinhilber, Beaver Falls; Charles E. Boshart, Lowville; Marcus Hartley, Martinsburg; Eli Sabin, Turin.

Monroe County.—Charles G. Schoen, Pittsford; De Witt C. Becker, Fairport; Joseph Hubbard Caston, Penfield; E. F. Ellsworth, Alphonso Collins, Rochester; H. E. Coy, Irondequoit; Hiram Shaw, Brighton.

Montgomery County.—R. S. Bulger, Hallsville; R. Schuyler, Fonda; J. Stewart, Amsterdam.

Nassau County.—Smith Cox, Freeport; Edwin C. Willetts, Mineola; William H. Jones, Woodbury; Edward A. Underhill, Glen Cove; Thomas T. Ramsden, Ocean Side; Samuel L. Hullett, Roslyn.

Niagara County.—A. C. Bigalow, Wilson; J. W. H. Kelly, Lewiston; John W. Thompson, Ransonville.

Oneida County.—Frank E. Rowe, Bridgewater; Fred M. Wooley, Boonville; E. E. Dorne, Vernon; John F. Harvey, Utica; John D. Donnafield, South Trenton; Michael Gaffney, Clayville; William H. Kauth, Marcy.

Oswego County.—James R. Ottman, Myron Worden, Minetto.

Ontario County.—Ira P. Cribb, Canandaigua; W. M. Warner, Clifton Springs; Charles M. Thompson, Gorham; Edwin C. Hawkes, F. G. Douglass, Honeoye; Frank L. Parshall, Seneca Castle; Charles McIntyre, Geneva; John R. Van Arsdale, Manchester; Charles J. Smith, Naples; Edwin Cleary, East Bloomfield; Fred C. Tones, Bristol Center.

Orange County.—John I. Bradley, Wawanda; George Moskier, C. H. Wygant, Newburgh; Lewis F. Goodsell, Highland Falls; John Orr, Orrs Mills; William Wood, Middletown.

Otsego County.—Adriel G. Murphy, Middlefield; S. E. Armstrong, Unadilla Forks.

Onondaga County.—Frederick M. Power, Solvay; W. C. Newell, Lafayette; Frank Z. Wilcox, James Maloney, Edward P. La Freviere, Syracuse.

Orleans County.—Charles Gledden, Clarendon; A. A. Donalds, Medina; Henry Ostrander, Knowlesville; G. W. Fitch, Albion.

Putnam County.—Henry Mabie, Patterson; W. E. Perry, Cold Spring; Emerson Clark, Mahopac.

Rensselaer County.—Fred D. Nichols, Petersburg; Alvin T. Hoag, Tomhannock; D. A. Healy, Troy.

Sullivan County.—J. Davidson, Beaverville; Charles Engelmann, Narrowsburg.

Saratoga County.—Everett Partridge, Edenburg; Spencer A. Sevattling, Middle Grove; George H. Whitney, Mechanicville.

Suffolk County.—Henry T. Brush, H. H. Denton, Huntington; James E. Gay, East Hampton; Daniel R. Davis, Coram; Capt. Frank Whitman, Islip; George H. Fleet, Cutchogue; James Thompson, Happaugua.

St. Lawrence County.—Edwin H. Merritt, jr., Potsdam; Charles S. Plank, Waddington.

Seneca County.—Charles S. Farr, Lodi; Joseph S. Barnes, Waterloo; John B. Corkhill, Tyre.

Schenectady County.—Cyrus Scrafford, John Hugart, Thomas Killian, Charles Barlydt, Jacob Vine, Alanson Robinson, Le Roy Van Janot, Schenectady; William T. Waddell, A. W. McMillan, Duaneburg; Garrett W. Freligh, Niskayuna; Walter Bradshaw, Rynexs Corners; D. H. Maynard, Sciota; Robert A. McAnley, Mount Pleasant.

Schuyler County.—C. H. Smith, Cayuta; Olin T. Nye, Watkins.

Tompkins County.—John L. Mandeville, Brookton; G. Rummer, Freeville; Albert Darrance, Newfield; John L. Hall, Danby; Clarence Buck, North Lansing; Horace D. Brown, Ithaca; Frank D. Fish, Enfield; William B. Sears, Groton.

Ulster County.—Henry McNamee, Fry Mountain; James McMillan, Brookhead; Simeon D. Van Wagoner, Rondout.

Westchester County.—A. Smith Hopkins, Armonk; Chauncey T. Secor, White Plains; Edward P. Kear, Yorktown Heights; Joseph B. See, Valhalla.

Washington County.—R. E. Warren, Hampton; John J. Morgan, Fort Edward; E. C. Whittemore, Granville.

DELEGATES MADE DURING THE CONVENTION.

Edward A. Bond, State engineer and surveyor; William Pierson Judson, of Oswego, N. Y., deputy State engineer and surveyor; Robert T. Taylor, Bolton, Clayton L.

Pasco, Thurman, Lolan R. Dunlop, Stony Creek, Warren County, N. Y.; A. R. Shattuck, president Automobile Club of America; Joseph Oatman, alderman Twenty-seventh district, New York; William H. Thomas, vice-consul, Queens County, New York State division, League American Wheelmen; Lucius H. Washburn, chairman highway improvement committee, New York State division, League American Wheelmen; H. M. Valentine, Hollis, Long Island, delegate from Good Roads Association of Brooklyn and Long Island; W. Pierrepont White, Utica, N. Y.; George Wymans, Greene County, N. Y.; E. A. Clark, Onondaga County, N. Y.; L. C. Boardman, delegate from the Highway Alliance, New York City; A. C. Kniskern, George Lape, Mechanicville, N. Y.; Arthur H. Battey, of New York, editor Tri-Weekly Tribune; William S. Crandall, of New York, editor Municipal Journal and Engineer.

NAMES HANDED TO SECRETARY DURING CONVENTION.

G. O. Mead, Walton, N. Y.; Alfred Romer, Edward C. Rice, E. O. Sherwood, S. E. De Puy, Auburn, N. Y.; John B. Uhle, president of the Highway Alliance, New York City; E. Lyman Brown, Poughkeepsie, N. Y.; Albert Dossance, Newfield, N. Y.; F. D. Fish, Enfield Center, N. Y.; William B. Sears, Groton, N. Y.; G. Rummer, Dryden, N. Y.; H. A. Brown, Ithaca, N. Y.; Clarence Buck, Lansing, N. Y.; G. W. Freligh, August John, Schenectady, N. Y.; F. B. Morss, assistant engineer eastern division, Albany, N. Y.; E. H. Alderman, Castle Creek, N. Y.; E. W. Van Slyké, Lestershire, N. Y.; J. M. Holt, jr., Port Dickenson, N. Y.; Ralph Russell, in charge Westchester County roads, Kensico, N. Y.; S. B. Jamison, Marathon, N. Y.; G. K. Smith, E. A. Clark, Lafayette, N. Y.; H. D. Alexander, assistant engineer western division, Rochester, N. Y.; G. O. House, assistant engineer western division, Lockport, N. Y.; John W. Weeks, Center Village, N. Y.; George W. Hobbs, Nineveh, N. Y.; Charles H. Flanigan, assistant engineer eastern division, in charge Orange County roads, Albany, N. Y.; N. E. Kelly and V. L. Tyrell, Harpersville; Smith Holcomb, Tunnel, N. Y.; S. S. Wilcox, Sanitaria Springs, N. Y.; James Sands, Vallina Springs, N. Y.; Otto Tolle, Albany, N. Y.; A. J. Rockwood, division engineer of western division of New York State, Rochester, N. Y.; S. D. Bush, Harrisburg, N. Y.; H. A. Van Alstyne, division engineer of eastern division of New York State, Albany, N. Y.; J. S. Neisey, Bellwood, N. Y.; William B. Landreth, resident engineer of eastern division of New York State, Albany, N. Y.; Samuel T. Hurlbett, Roslyn, L. I.; Henry C. Allen, resident engineer of middle division of New York State, Syracuse, N. Y.; George O. Mead, Walton, N. Y.; M. W. Wilbur, resident engineer of western division of New York State, Rochester, N. Y.; F. W. Hartman, Downsville, N. Y.; George E. Gladstone, Margaretville, N. Y.; F. N. Sanders, assistant engineer eastern division, in charge Ulster County roads, Albany, N. Y.; E. R. Dusenbury, Liberty, N. Y.; W. L. Thornton, Monticello, N. Y.; M. L. Dodge, Rockland, N. Y.; Hugh Hughes, Eli Sabin, Turin, N. Y.; L. K. Devenorf, middle division, Syracuse, N. Y.; H. H. Reed, supervisor, Honeoye, N. Y.; F. G. Douglas, commissioner of highways, Honeoye, N. Y.; Edward Clary, commissioner of highways, East Bloomfield, N. Y.; John C. Van Arsdale, Manchester, N. Y.; Edward Dailey, Babylon, N. Y.; Edward Bailey, Patchogue, N. Y.; Frank Parker, Islip, N. Y.; Dr. Skinner, Southold, N. Y.; E. H. Smith, Smithtown, N. Y.; W. L. Dickinson, Springfield, Mass.; Jonas H. Brooks, Berne, N. Y.; Silas Albertson, Mineola, N. Y.; G. Vanderpool, Selkirk, N. Y.; S. L. Depew, Auburn, N. Y.; Albert DeGraff, eastern division, Fonda, N. Y.

W. PIERREPONT WHITE. I would like to make a suggestion. As I understand, when we convene this afternoon matters will be brought up for general discussion. I would like to ask the delegates, if no better plan is suggested or a more important matter, that we take up

for discussion the first thing this afternoon the question of the adoption of the money system by a State act throughout the entire State. Some counties have done it; some towns have done it; but there are only about twenty-five that have. My idea is that there is nobody to be criticised for doing as their fathers and grandfathers have done. We have all done just what we have been taught to do. It is a question of progress. Will it be to our advantage, and is it to the advantage of the commerce of the State to change from the labor system to the money system by a general State act? I would suggest that the discussion this afternoon be in the form of a roll call, practically, of each town and each county for an expression of local opinion. Let us get at the people and see what they want. If the people, or a majority of them, want State aid under the Fuller act and apply it to the State in the line of progress, it will only take one little statute to benefit every mile of road in the entire State after 1903.

On motion of Mr. White, the question of the "money system" was made the special order for the afternoon session.

WILLIAM F. O'NIEL, chairman: This convention is organized on a voluntary basis. It was an inspiration on the part of Engineer Bond, who had been directed to go around the State; and he thought of this plan of calling you together. If there are associations of any sort who are interested in this question and who are here and who wish to cooperate with us, I would like to have them hand the names in so that they may become members of this convention. The rolls will be open.

On motion of Mr. Slack, of Broome, the convention adjourned until 2 p. m.

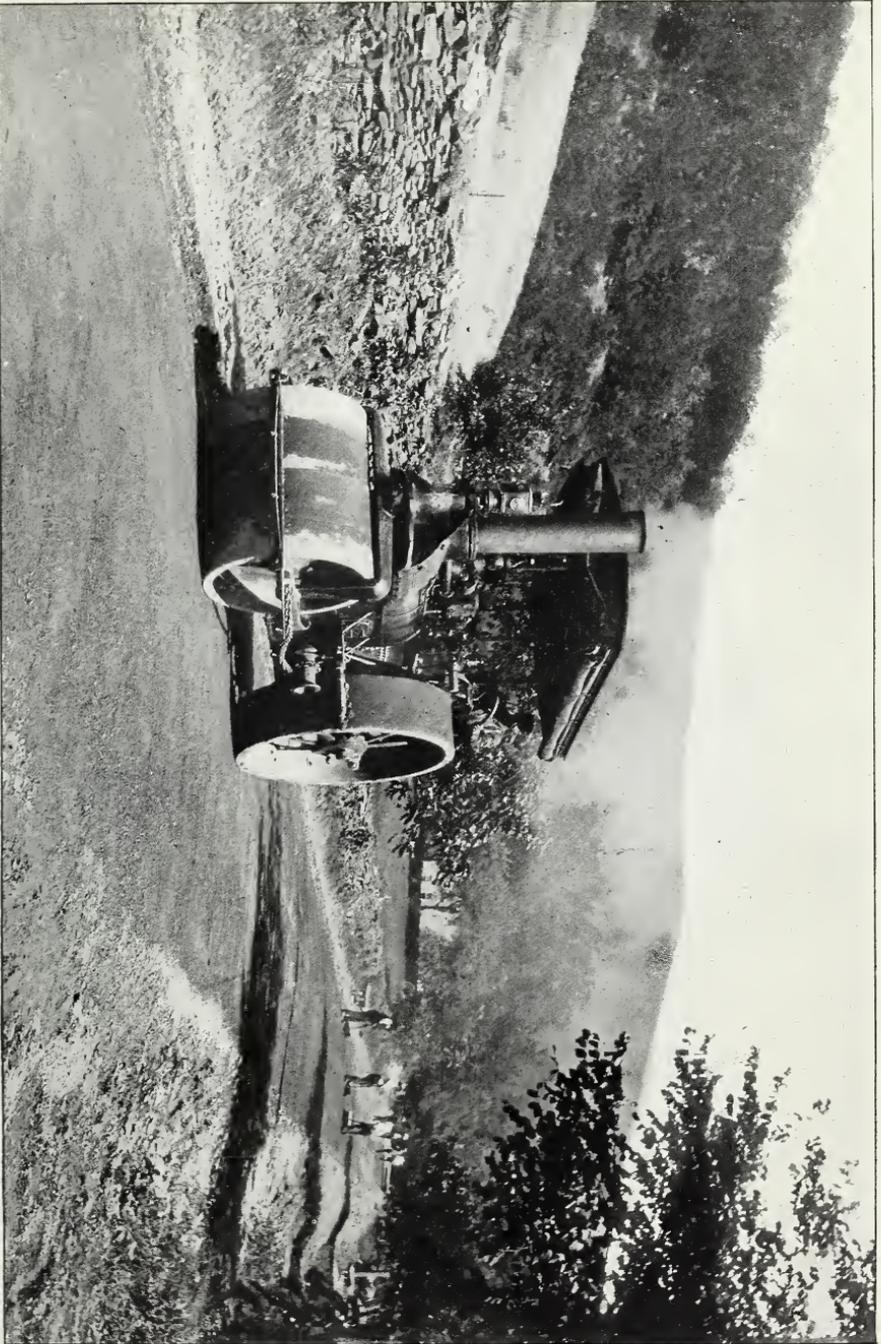
TUESDAY, JANUARY 28, 1902—AFTERNOON SESSION.

The convention was called to order at 2.25 p. m.

The chairman stated that the first business was the special order for the consideration of the "money system."

MONEY SYSTEM OF HIGHWAY TAX.

W. PIERREPONT WHITE. Mr. Chairman, the question before the convention this afternoon is the discussion of the change from the "labor system" to the "money system." In taking up in the State of New York the discussion of how we can get at good roads quickest, there seems to be a general feeling through the many counties that if we could only have the money system our roads would commence to mend immediately, and that we would not have to wait such a long period for State aid, as is suggested in one of the Higbie-Armstrong bills. In other words, if some method can be gotten at by which the tax can be paid in money and expended under the highway commissioner our roads would commence to improve immediately. Twenty years ago Senator



ULSTER AND DELAWARE ROAD ULSTER COUNTY, N. Y., IN PROGRESS OF IMPROVEMENT IN 1901.

Along Esopus Creek Valley, near Pine Hill. Base and top of local "bluestone" (sandstone), bound with "bluestone" screenings. Road built by town board as contractors.

Coggeshall introduced a bill in the assembly (he was an assemblyman at that time) asking to have the law amended so that everybody would pay their road tax in money. Mr. Coggeshall immediately became the most unpopular man in the assembly. Now, in the twenty years since that bill was introduced by Senator Coggeshall, it has come about that there has been—four years ago—a statute put on the books known as the Fuller bill, by which it was made optional in each town, on the request of twenty-five taxpayers, to vote to change from the labor system to the money system, and if the people did not like it, on the request of another twenty-five taxpayers, or the same men, they could vote at any special or town meeting to change it back again. In other words, local control was granted by that statute as to how people could pay their tax. In the four years, from thirteen towns that received State aid and voted to change, there are now twenty-five counties and one hundred and thirty-five towns which have changed voluntarily from the labor system to the money system of working their roads. The result in those one hundred and thirty towns is that it is a good thing. Now, the question comes, if by this optional experiment these towns have found it to be a good thing, and as there is nothing wrong about it, is it not time for a highway convention to take up the discussion of whether the whole State, by a State act, should take advantage of the experience already acquired by these one hundred and thirty-five towns? No town is to be blamed, and no county is to be blamed for working under the labor system. It is what we were taught and what we were brought up with, and what our fathers did—they didn't break away from it and have a money system until they had to. We wouldn't break away from it until gatherings like these discuss it.

My idea for discussion this afternoon is for each of the county representative delegates here to get up in turn and give their views as to whether it is desirable, and I present a formal resolution in order to discuss it:

Resolved, That this convention request their legislative committee to draft a bill and present it to some member of the assembly or senate, requesting the enactment of a law which will, after January 1, 1903, change the method of paying taxes from labor to cash at 50 cents on the dollar, and pay, from the State, 25 per cent of the amount raised back to the towns up to one-tenth of 1 per cent of the assessed valuation of those towns.

In other words, it is making a State law of what is now an optional law in each county.

In Oneida County four years ago one town adopted the money system. Later the three towns around it adopted the money system. The board of supervisors then recommended it for the other towns, and at the next election thirteen towns adopted it, and now towns having a mileage of 1,000 miles have the money system. Four or five towns

in Herkimer County have the money system. The southern counties adopted it, and owe much of their rapid change to the experience.

I believe in a discussion right here, as I have opened it on the lines which I think to be advantageous to everybody. If this convention think it best to suggest a change in the sentiment, that change will do more for the roads in New York State in one year than any other thing we can do.

JOHN D. DONNAFIELD, of Oneida: I desire to offer the following resolutions. The committee appointed by the board of supervisors of Oneida County find that the law known as the Fuller law makes no provision for keeping the highways free from snow during the winter months. Under the labor system the highway commissioner appoints path masters, who have the power to order labor out to open the roads, which is an additional tax. The question is disturbing the minds of the inhabitants of the towns having adopted the money system, and causing a great deal of dissatisfaction and comment, and claiming that the law as it now exists is incomplete and inefficient to meet the demands of the traveling public:

Resolved, That this convention recommend that the sum of 5 per cent, or such portion thereof of the money raised for working and maintenance of the highways, be appropriated for that purpose. [Keeping the highways free from snow during the winter months].

Resolved, That this convention recommend that the law be so amended as to afford this much needed relief.

Joseph B. See, of Westchester, rose to a point of order.

The CHAIRMAN. In the absence of any rule, and the general character of the convention, we can not be held down as closely as other bodies. The chair declines to receive the resolutions and thinks that, if there is no objection, they ought to be referred to the committee on resolutions. The point of order is not well taken.

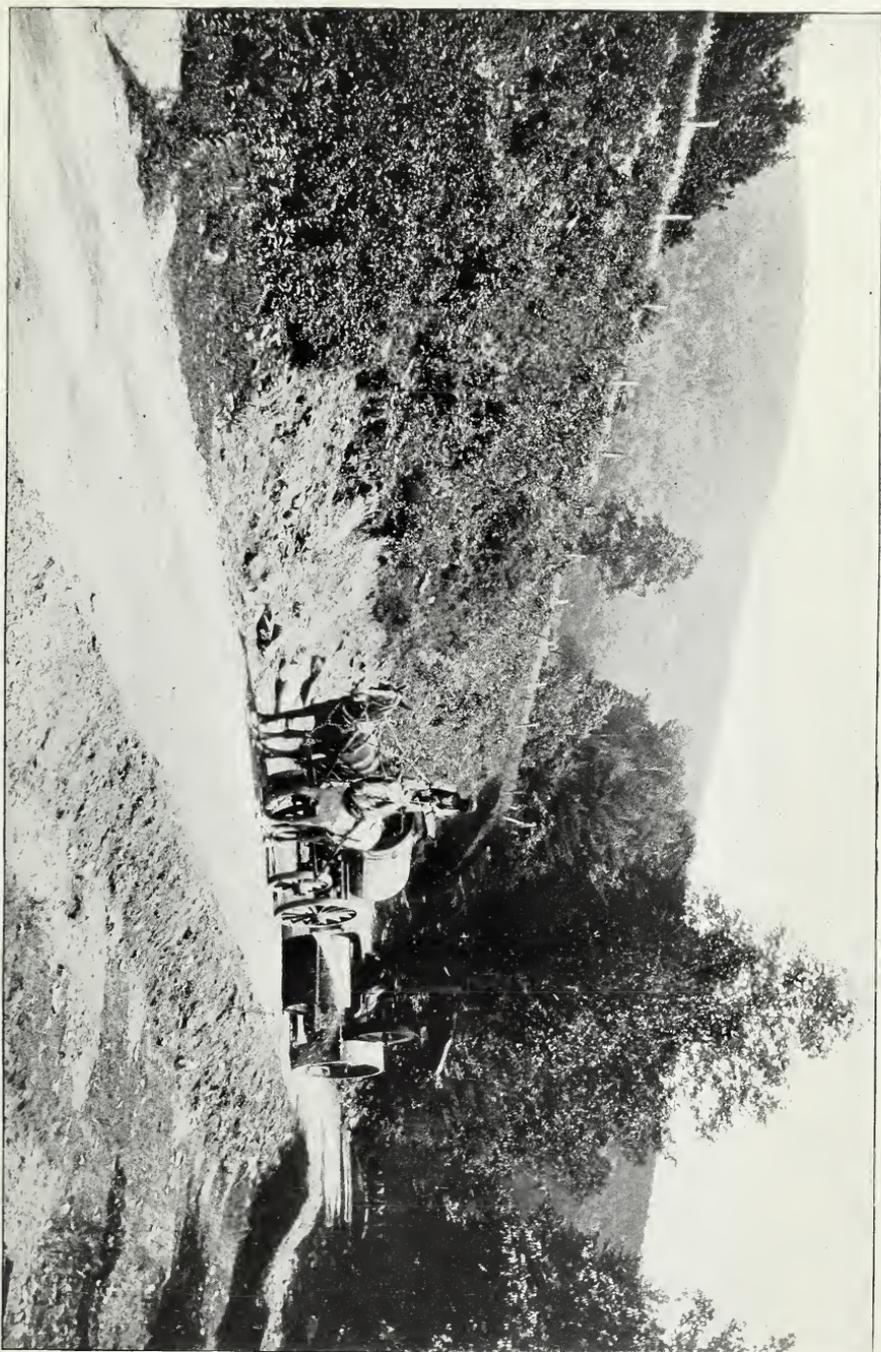
On motion of B. B. Badger, of Broome, the resolutions were referred to the committee on resolutions.

Frank Z. Wilcox, of Onondaga, moved that the roll of counties be called, and that each county be limited to five minutes in the discussion of the question, that there may be as general a discussion as possible.

The motion by Mr. Wilcox was adopted, and the secretary called the roll of counties, with the following expression of sentiment:

EXPRESSION OF SENTIMENT BY COUNTIES ON THE MONEY SYSTEM FOR
ROAD IMPROVEMENT.

Albany County.—Dr. EDWARD J. BEDELL. I represent the town of Bethlehem, which was the first to adopt the money system two years ago. There were so many that wanted the money system that we carried the town by 165 majority for the system. So far as we have



ULSTER AND DELAWARE ROAD, ULSTER COUNTY, N. Y., AS IMPROVED IN 1900.

Along Esopus Creek Valley, near Phoenicia. Sprinkler wetting front wheel of roller. Base and top of local "bluestone" (sandstone), bound with "bluestone" screenings.

been working under the money system, we who have an interest in good roads, realize that we are tending toward better roads. It is a step in the right direction. I am here to say that under the money system our roads have been kept open better than they were under the other system, and I believe it is the proper way to work. I believe we are on the right step toward good roads. I am in hopes of seeing at the next election all the towns in our county adopt the money system.

The CHAIRMAN. In the law as it now stands, to change from the labor system to the money system, it is necessary to have a vote at town meetings. That is a pretty slow process, and it means a good many years. The recommendation of the committee that seek to change that feature of it is to get a law passed which will put the whole State upon the money system. In calling the roll to discuss the merits of the cash system as against the old labor system, I think particularly the desire is to obtain the opinion of this convention as to the desirability of making that change. So in this discussion the committee would like especially to know how the members feel about the passage of a State law putting the whole State on a cash basis at once.

RALPH A. GOVE. As I understand the bill, it is that where the assessment is to be paid it would be paid by 50 per cent of the amount assessed. If that is the case, where the amount of labor amounted to \$8,000 the amount of tax would be \$4,000.

The CHAIRMAN. As I understand it, this 50 per cent is the minimum; a town might raise more if it thought best.

E. A. BOND. That is correct.

Broome County.—DAVID B. KING. In our county we have one town working under the money system. I think that a majority of the board of supervisors would be favorable to this proposed action on the part of the legislature.

JOSEPH H. BROWNELL. I am one of the gentlemen whose name is attached to the report before you, and I was not fooling in any way when I recommended that the money system be substituted for the labor system. I believe that it would promote the interest of good roads in the State of New York if the system was changed to the money system from the labor system. As far as I am personally concerned, I believe that I would represent a majority of the people in Broome County in this proposition, and I would be favorable to urging the members of the legislature to make that change.

Chemung County.—CHARLES CHAMBERLAIN. I will say that I am in favor of the money system throughout the State.

Cayuga County.—WEBB J. GREENFIELD. I think there are but two towns in our county that have taken a vote in regard to working under the money system. One of those has never commenced it. The other has adopted it, and obtained good results. I think, as far as my expe-

rience is concerned, that the money system would give a good deal better results than the labor system. I think we could have more results and better roads under the money system. I should recommend it.

Cattaraugus County.—H. C. HOLCOMB. I am highly in favor of any proposition that would bring about better condition of our highways. I think at present, knowing our people as I do, I should favor the resolution, coming from the gentleman from Oneida, of commencing a little at a time, and adapting our people to it—paying, for instance, a percentage of the highway tax and working out the other part. Up in Cattaraugus they are just beginning to get stirred up to the necessity of doing something.

Chenango County.—CHARLES G. BROOKS. I learn that we have ten towns in our county which have adopted the money system, and that it is giving entire satisfaction. I think I certainly would be in favor of a change to the money system in my town, now working in the old-fashioned way. From what I have learned from meeting supervisors, there are many more who would be glad to make the change! I think it is certainly time that there is a change some way to get competent work. My experience has been such that I have been upon the road driving very much, and I have learned that farmers are not competent road builders. Each farmer will work his own district in his own way, but how many of them have different ways of doing it! I think it time we adopted a uniform way, and consequently the money system would be a great advantage.

Columbia County.—J. C. RIGHTMYER. As far as Columbia County is concerned, I could not say for the whole county. We have one town in our county that is working under the money system, but I think the majority of them would be in favor of the money system. It benefits the roads. I am in favor of the money system.

Cortland County.—N. F. WEBB. I will say that the situation in this county is practically this: One year ago last fall one of the towns in the county changed from the labor to the money system, raised the money at that time, and last summer worked the roads under the money system; the supervisor from that town reported that all were well pleased with the change. Last February at the town meeting seven more of the towns of the county voted to make the proposed change, so that now in Cortland County there are eight towns out of the fifteen under the money system. The other seven towns have had no experience, but will put the system in practice next summer, having raised the money this last tax. In regard to making the change compulsory, or making it a State law, I could not answer for the whole county, but judging from the position that the board of supervisors have taken, I should say that the plan would meet with approval in the county.

Dutchess County.—R. W. RIVES. In regard to Dutchess County, I think I can safely say that the majority of the board of supervisors is heartily in favor of the money system, inasmuch as fourteen of the twenty-one towns work their roads on the money system, two of which adopted the system last election. I think the majority in this case shows a decided sentiment in favor of working roads by the money system, and would be, therefore, in favor of any legislation that would guaranty such a result.

Erie County.—JAMES A. WOODARD. I think that Erie County is progressive enough, and that when the entire State is working the money system satisfactorily the people would adopt it, but I do not think they would go on record as adopting it.

WILLIAM H. CONBOY. There are but two towns in Erie County that have adopted the money system. One is Grand Island, which I have the honor to represent. We have been on the cash system for two years and are thoroughly satisfied with it, and would not go back to the other system for any consideration. I do not know what the resolution is that is up for discussion before the convention, but I do say I am in favor of the passage of legislation making it mandatory upon the towns to adopt the cash system. The way I would suggest to get at that would be the passage of some legislation permitting the boards of supervisors to place the towns upon the cash basis. Erie County is composed of twenty-five members from the city and twenty-five members from the country, and I do not believe that if it was left to a vote of the towns of Erie County that they by themselves will adopt the cash system. It takes too long to get them awake. After they once adopted it and tasted its fruits they would all be heartily in favor of it, but it is very hard to get the rural members to adopt new legislation, even for their own benefit. I believe that some legislation should be adopted to make it mandatory upon the towns to adopt the cash system, and until that is adopted there will be no movement or any great progress noticeable in the highways of the State.

Franklin County.—WILLIAM F. O'NIEL. Two towns in our county have adopted the cash system, and they are well satisfied with it; in several other towns I hear they are about to do so. Of course, I have no means of knowing the wish of the majority of supervisors in the county as to whether a mandatory law ought to be adopted, but personally I believe there is no other way. So far as I know the sentiment in Franklin County, it is in favor of the cash system, and I personally am in favor of a mandatory law.

Genesee County.—DAVID CLARK. Genesee County is not working under the money system, and the roads show it. I myself would be in favor of adopting the money system; I would be in favor of adopting the money system from a business standpoint, because I believe at the time of year when the road work is ordinarily done there is not a

farmer in Genesee County who can afford to put a day on the road for \$1, as at that time his farm needs attending to. This catch-as-catch-can and go-as-you-please manner of working roads is about played out. I believe that if any legislation established a money system we would all fall in line, but I could not speak for my county, as this matter has not been discussed largely with us. At the last session of our board we passed a wide-tire law, and we are in hopes something will be done to put this matter on a business basis, so there will be some method of improving the roads.

Greene County.—M. O'HARA. Greene County has adopted the money system; I think last fall six towns voted it that way. The town I have the honor to represent has been working the roads under the money system for a number of years, and the good results obtained have been the means of bringing about the vote of the other boards of the county. We would not go back to the labor system under any consideration. We did not have any roads when we worked under the labor system, and we had no system or order. I do hope this law will be enforced, so that every town in the State will have to work their roads under the money-tax system. I hope the legislature will see its way clear to enact such a law, and I know every member will be in favor of it. I hope it will be a State law.

Herkimer County.—THOMAS WILLIAMS, Jr. We have four towns working under the money system. I understand there are several other towns to hold a special meeting this spring to bring about this result. I believe the sentiment in Herkimer is in favor of it, and I believe that our people would be in favor of any legislation to benefit our system of highways.

Jefferson County.—SETH MATHER. I think the time has come, perhaps, when Jefferson may change. I know under the old law that about all that is necessary to do a day's work on the roads is to hitch your team beside a fence and call it three days. We are of the opinion that the so-called Higbie-Armstrong act is defective, inasmuch as it will require two hundred years under the present appropriations by the State to construct the important highways of the State. I have an idea that the good-roads act, as presented here this afternoon, would be agreeable to my section of the country.

Monroe County.—CHARLES G. SCHOEN. Monroe County is under the labor system, but we have with us to-day five delegates who are all in favor of the money system. What the rest of the board of supervisors is in favor of I can not say, but I think the only way to get good roads is the money system. As the gentleman behind me says, "They take a team out and hitch it to a fence and call it three days." With us they don't hitch the team to a fence, for it will stand without hitching. They hire a man to watch it and call it four days. I don't think it should be left to towns to vote whether they should



MAMARONECK AND WHITE PLAINS ROAD, WESTCHESTER COUNTY, N. Y., AS IMPROVED IN 1901.

Base of local gneiss; top of Meriden, Conn., trap rock, bound with Tomkins-Cove Hudson-River limestone screenings.

have the money system, because a majority of them would vote against it. I don't think you would have the money system in all towns unless by act of legislature.

Montgomery County.—R. SCHUYLER. Montgomery County is composed of ten towns, and not one of these towns ever adopted the money system. The subject has been agitated by different members of the board of supervisors, who all favor the system, but no action has ever been taken. I think it would be an advantage to have the money system adopted for the benefit of farmer and also for the greater benefit of highways, and I heartily indorse the cash system.

New York.—A. R. SHATTUCK. So far as I can speak for the county of New York, we are absolutely in favor of the money system.

Nassau County.—WILLIAM WILLETTS COCKS. So far as Nassau County is concerned, we are entirely under the money system, and therefore I can not tell anything about the labor system. I am astonished that people are so ignorant of their own interests that they don't get on a money system, where they belong, with our own county of Nassau.

SMITH COX. As to the labor system, we have abandoned that long ago. We have had a good experience, and I advise the people in all parts of the State to abandon the old system.

Oneida County.—JOHN D. DONNAFIELD. Thirteen towns have adopted the money system; each and every town that has adopted that system reports the most favorable result and are thoroughly satisfied. I can not say that I, as one, would want to make this a compulsory act. If it is a good thing the people will adopt it voluntarily, and what the people will adopt voluntarily is in better grace than compulsory.

Onondaga County.—FRANK Z. WILCOX. In regard to Onondaga County, I feel that I am within bounds when I say that the county is in favor of the money system. We have nine towns out of nineteen in Onondaga that have adopted the money system, and this year, for 1901, will draw State aid of \$5,000 and over. The board of supervisors have adopted at different times several resolutions recommending the county to adopt the money system, and I think I can safely say that Onondaga County is in favor of the money system. I am sure that Onondaga County is in favor of a compulsory law for the money system.

Ontario County.—IRA P. CRIBB. Personally, I am in favor of Mr. White's resolution. We expect to present the matter at the next town meeting. In the county we have but one town that is working under the money system. I wish it might be more. Just how the county may feel on that, I am unable to say.

Orange County.—GEORGE MOSHIER. The delegates, including our assemblyman, are in favor of Mr. White's suggestion. In three years nine towns out of twenty-seven in Orange County have adopted the money system.

Orleans County.—G. W. FITCH. Personally, I think the money system much preferable to our old system, and I think when our people become educated up to that point, that they will also be in favor of it, but it must be remembered, as was suggested, that this way of working the road tax is somewhat new.

Oswego County.—JAMES R. OTTMAN. We all know it is the right system; we all know that it is as it should be. I think it is to our interest to pass legislation in some way making it compulsory.

Otsego County.—ADRIEL G. MURPHY. So far as I am personally concerned, I believe the money system is the proper system. I don't know whether the people would want this law passed in the shape in which it is reported, but I think if the money could be used judiciously, if it was passed, the people would agree with it. As far as I am personally concerned, I am in favor of it, and I believe that my town is.

Putnam County.—HENRY MABIE. We have six towns in our county, three of which have availed themselves of the provisions of the Fuller act, and the other three have not as yet. I am a firm believer in that method of working the highways. I am perfectly willing to compel those three towns to adopt the money system by State enactment.

Queens County.—WILLIAM WILLETTS COCKS. We were one of the first counties to indorse the money system, and Queens County is certainly in favor of good roads. The object lesson in Queens County ought to be sufficient to convince almost anyone who has given it careful study. Our farmers will testify that good roads are an absolute necessity.

St. Lawrence County.—CHARLES S. PLANK. As far as St. Lawrence County is concerned, we have worked the highway system, and it has been under the old, antiquated plan of working out highway tax, but for the last several years there has been an agitation and change of sentiment which is very noticeable—it has, I think, been felt that there is a growing and prevailing sentiment in favor of the money system. Five towns in our county voted on the money system, and in all but one it was carried, and in that one it was a tie. From reports received from nearly every town in the county and what the supervisors say about it, I am sure in the near future we will have a money system in the entire county. I have no doubt but that they all would be willing to favor the proposition here to-day.

Saratoga County.—GEORGE H. WHITNEY. We have but one town in our county that has adopted the system to improve its roads under the Fuller act. I understand the system is very popular. Personally, I am heartily in favor of this system, and I think in saying this that I express the sentiments of the town I represent. So far as the other eighteen towns are concerned, I will say this much: We adopted a resolution at the last session of the board urging each supervisor to

use his influence for the Fuller system. I should be in favor of the passage of an act by the legislature compelling boards of supervisors to adopt this money system.

Rensselaer County.—D. A. HEALY. As far as the system is concerned, I am not acquainted with it, but would say what will suit the majority will suit Rensselaer. [Mr. Healy entered the convention as his county was called and did not hear preceding remarks.]

Schenectady County.—GARRETT W. FRELIGH in his remarks dwelt on the competency of the highway commissioner to properly perform the work, making no allusion to the money system.

Mr. HOAG. There is only one way to remedy the existing evils, and that is by the adoption of the money system. If a man is opposed to the money system, and you ask him why he is opposed, you will find that the man wants to go on the road and save a dollar and not to earn a dollar. The present law should be repealed, and if this body should recommend to the legislature the money system, I think it would be one of the greatest acts of the age.

Schuyler County.—C. H. SMITH. Personally, I am in favor of the money system, and I heartily think that Schuyler County is in favor of it.

Seneca County.—CHARLES S. FARR. We are still working under the labor system, but I think the sentiment is in favor of the money system. I think we should have a State enactment to hurry the matter along, and not take a hundred years or so.

Suffolk County.—MR. MAYLOR. I voice the sentiment of the town when I say we are in favor of the money system.

Tompkins County.—JOHN L. MANDEVILLE. I not only believe in the money system now, but I have believed in it a good while. I have agitated it for a dozen years. I think it is better to retain the law just as it is than to obtain further legislation at present.

Ulster County.—HENRY MCNAMEE. In speaking for Ulster County, I desire to state that there are two towns in our county now working under the Fuller system. One of these towns has had the system for three years, and from reports received it is a good thing. During the last session of our board the question whether the whole county should not be obliged to adopt the Fuller system was brought up, and the members thought that a law could be passed by the legislature this winter making it mandatory upon every county to adopt the Fuller system. We hope, the members and myself, that a law will be passed to make it mandatory upon the boards of supervisors of the several counties to adopt the Fuller system. If they do not the county of Ulster will unanimously adopt it.

Warren County.—ROBERT T. TAYLOR. I am one of the representa-

tives from Warren County, which has eleven towns, and they never have in any one of these towns attempted to adopt the money system. There are three representatives from Warren County here, and all three are in favor of the money system, and so are a majority of the board of supervisors in Warren County.

Westchester County.—JOSEPH B. SEE. I am heartily in favor of the money system, but not in favor of compelling every county to adopt it, as I think that if they are foolish enough to work under the old system they should suffer the consequences.

Orange County.—C. H. WYGANT. I don't know but that I will have to agree with Mr. See, and say, "Vote against the resolution."

W. PIERREPONT WHITE. Mr. Chairman and gentlemen, I am going to offer a resolution which will test the sentiments of the delegates present. May I ask you in recording your vote to forget for the moment that you are supervisors, highway commissioners, and members of assembly? May I ask you to express your individual feelings so that it may be recorded? Not what you think is necessary to be done in order to satisfy your constituents, but what you individually believe will be for the interest of your State and your county. On these lines I offer the following resolution:

Resolved, That this highway convention direct its committee on legislation to prepare and urge the passage of a bill to make the money system apply to all the counties in the State after January 1, 1903, on the same terms as now provided by the Fuller bill—that is, 25 per cent of the money to be raised should be paid back to the towns.

Mr. CONBOY. I would like to ask Mr. White how he proposes to bring this about.

Mr. WHITE. By drafting a bill on the same terms as the Fuller bill, leaving the Fuller bill on the statute books; draft a bill and start it on its passage, and see if it would be possible to pass it at this session of the legislature.

Mr. HOLCOMB. I believe home rule ought to apply, and I move to amend the resolution offered by Mr. White, if I understand it, substituting that this convention ask the present legislature to pass a law compelling each town in the State of New York which has not already adopted the money system to vote upon that proposition at the next election.

The CHAIRMAN. The question is upon the amendment offered by Mr. Holcomb.

The amendment was lost, and the vote was taken upon the original resolution, which was adopted.

Mr. WILCOX. In order to expedite business, I desire to offer the following resolution:

Resolved, That in accordance with the recommendation of the standing committee there shall be appointed by this convention a standing executive committee to be



ELMSFORD AND EASTVIEW ROAD, WESTCHESTER COUNTY, N. Y., AS IN PROGRESS OF IMPROVEMENT IN 1901.
Base of local gneiss; top of Rockland-Lake Hudson-River trap rock, bound with Clinton-Point Hudson-River limestone screenings.

composed of two members from each of the eight judicial districts of the State, and that nominations for said committee shall be made at meetings of the delegates representing the counties composing each of the several judicial districts of the State.

The resolution was adopted.

Mr. CONBOY. I offer the following resolution :

Whereas there has been introduced and is now pending in the legislature a bill known as "Assembly bill No. 213," entitled "An act to amend the highway law relative to extraordinary repairs of highways and bridges," which amends the present law so as to take from the town board and the officials of the towns elected by the people for the purpose of caring for the roads and bridges in their several towns the power to perform the duties which they are elected to perform and vests in the State engineer a controlling power for the building of bridges, which is contrary to the best interests of the people of the towns; therefore,

Resolved, That we, supervisors of the State of New York, in convention assembled, do respectfully protest against the enactment of the bill above mentioned, and that the senators and assemblymen be urged to use all honorable means to defeat the passage of the bill, and that copies of this resolution be sent to the senators and assemblymen.

The resolution was referred to the committee on legislation.

Mr. LYON. I move that a discussion regarding the provisions of the Higbie-Armstrong act and some questions regarding the theories of bonding be made a special order for discussion by this convention to-morrow morning at 10 o'clock.

The motion was carried, and the convention adjourned at 4.10 p. m.

WEDNESDAY, JANUARY 29, 1902—MORNING SESSION.

The convention was called to order at 10.30 a. m. by Chairman O'Niel.

Mr. WILCOX. Your committee on business would respectfully report as the order of business for January 29 the following:

First. Discussion of the bonding system for the construction of roads under chapter 115 of the laws of 1898, known as the Higbie-Armstrong bill, to be opened by Hon. Edward A. Bond.

Second. The subject of wide tires. The discussion to be opened by Frederick M. Power, esq., of Onondaga.

Third. A paper by Edward P. North, of New York, upon the "Relations between macadam roads and electric street railways."

Fourth. Paper by ex-Senator Dodge, Director of the United States Office of Public Road Inquiries, upon the subject of "Highway improvement by State aid."

Fifth. "The relation of common roads to railroads," by Prof. Lewis M. Haupt, of Philadelphia.

Sixth. Miscellaneous business.

Seventh. Adjournment.

The report of the committee on business was adopted.

The CHAIRMAN. The business before us this morning is the special order of yesterday, the provisions of the Higbie-Armstrong act, and some questions regarding the theories of bonding.

Mr. LYON. In order to proceed regularly, I would introduce this resolution:

Resolved, That we request the governor and legislature to grant an appropriation of \$1,000,000 this year.

MR. MATHER. In voting on this question, I would like to ask whether each county is entitled to one vote, or whether the vote will be by different representatives of this organization. In taking this vote one county might have several votes and another county perhaps not have more than one or two, so I would ask if the expression is to be made that each county have but one vote, because you wouldn't get a proper expression from the State if one county carried ten votes and another county one.

MR. SEE. I would request that the resolution be amended to carry \$1,500,000.

THE CHAIRMAN. This convention is not an official convention; it is in its character voluntary. There isn't anything binding upon anybody in our action here. We are simply as citizens requesting the legislature to appropriate money, and therefore the chair would hold that every member of this convention would have a right to vote upon the question.

After remarks by Mr. See on the amendment, stating facts in regard to the county of Westchester, a vote was taken and the amendment was defeated.

The original resolution was then adopted.

THE BONDING SYSTEM FOR IMPROVEMENT OF HIGHWAYS.

THE CHAIRMAN. The next order of business is the discussion of the bonding system for the construction of roads under chapter 115 of the laws of 1898, known as the Highie-Armstrong bill, to be opened by Hon. Edward A. Bond.

EDWARD A. BOND, of Jefferson County, State engineer of New York: Mr. President and gentlemen, I hope I will be pardoned if for a moment I revert to my own county of Jefferson. I find one of the encouraging features in the progress in the interest of good roads is the fact that this year we have some delegates from that county. The first convention that we had my county did not do me the honor of sending any delegate at all. This year we have three, and I find that time has touched their heads somewhat. One has a silver crown, and the other says that he is reaching the goal steadily, where there is no more parting. Our northern county of Jefferson, which wouldn't send a delegate three years ago, last year sent two, and this year three. Within the last year they have made an application for a highway and submitted it, and it was voted down by the board of supervisors because of fear that the roads in that section wouldn't stand up under our manner of road building. I hope to be pardoned if for a few moments I address my conversation to delegates of my own county. What I will say to my own county will equally apply to perhaps every county in the State. In the building of roads in the many counties we meet all sorts of condi-



FIG. 1.—REPAIRING RUTS MADE BY NARROW-TIRED WAGONS, OCTOBER 22, 1901.



FIG. 2.—RESULTS OF REPAIRS AT SAME PLACE AS SHOWN IN FIG. 1, OCTOBER 25, 1901.

Improved in 1900. Base of local limestone; top of Hudson-River trap rock, bound with screenings of local, Buffalo, and Tomkins-Cove limestones.

EAST AVENUE ROAD, EASTWARD FROM ROCHESTER, MONROE COUNTY, N. Y.

tions. For instance, in this county of Albany, where we are, we have the worst sand to contend with in any county of the State. Within 5 miles of this point we have the worst clay to contend with in any county in the State. We have clay that has been gullied out by the action of the water for years. An old road went down this steep bank or gully with a grade of 14 to 16 per cent. We have changed these grades to 5 per cent. We have done this where there has been a mountain of clay some 200 feet at some points, this clay probably being 300 feet in depth. The clay is such that it is suitable for building bricks, a clay that is as bad as in any county in the State. We built roads there with 6 inches of macadam that will stand any weather—and with the ordinary improvement of maintenance, which must go on these roads or any other roads—roads that are indestructible if you maintain and put on the amount each year that is worn off.

To come back to our own county once more, I wish to remind the delegates of some of the things I have seen in old Jefferson. Some one yesterday spoke of hitching a horse or a team to a fence and charging three days for it. I did not happen to see that, but whether that is true or not, I have seen this: In a village in Jefferson County that I have been through there were scattered along the road stones probably the size for a man to handle from hand to hand. Along this road were old gentlemen with their hammers, sitting there with cushions, breaking up these stones. These men were earning \$1 a day, and were earning it honestly. They break these stones and break them well. After being broken the stones are left there and not rolled, as it is expected that the traffic along the road will make a good stone road. What is the consequence? All through the summer you will find people driving in a ditch on one side of the road, and then crossing over to another point and go in a ditch, because it is a little better. All summer long they keep traveling in a ditch until fall comes, when the roads are so bad they are obliged to go on stones, and so they go on these stones from year to year. What is true in Jefferson is probably true in every county in the State, and I bring this up as an illustration. I want for a moment to describe our method of road building.

The first step in the preparation of plans for good roads is the survey, which, if properly done, will improve the grades from, at times, 10 to 20 per cent, changing the location of the road, to reduce them, to 5 or 6 per cent, or better. After the map and profile are once made the engineer carefully locates the grade of the road, so that as nearly as possible the excavation from rock and earth cuts will form the necessary embankment, always keeping in view the proper drainage of the road, allowing for ditches on either side of the finished road to be from 2 to 2½ feet below the crown, with plenty of culverts, either open culverts, box culverts, or cast-iron or vitrified pipe drains, sufficient

for the water to quickly flow away in case of heavy rainfall or sudden winter thaw.

In laying the grades the engineer does not necessarily seek to find long continuous grades of a given percentage, but permits of undulating grades, always bearing in mind, however, to make the percentage of the grade as low as is consistent with the surrounding conditions. The roads are graded for receiving the macadam surface, varying from 12 to 16 feet in width, and under unusual circumstances they are sometimes for short distances made 20 feet in width. The lower surface is graded to conform to the exact crown of the road when finished, and is graded so at all times to be an equal 6 inches below the macadam surface. After being properly graded, a 10-ton steam roller is placed upon it, and it is thoroughly rolled about five or six times, and if this rolling develops soft spots in the earth, this earth is to be removed and other earth put in its place, so that the whole earth surface is of one consistency throughout any given section of the road.

At times very deep sand is met with that requires a dressing of shale rock or clay to cover it, and also a similar material to provide wings on either side of the macadam to properly hold the macadam surface in place.

In laying the stone for these roads we usually select the best native stone in the immediate neighborhood for the lower course. These stones are drawn to an ordinary rotary or jaw stone crusher, and after being crushed are elevated to a rotary screen that separates the stone into three separate grades; one-half to 1 inch in one compartment, and 1 inch to $1\frac{1}{2}$ inches in another, and $1\frac{1}{2}$ inches to 3 inches in another; the screenings from dust to one-half inch in size being kept separate. In a section where there are ledges of rock and knolls of rock cutting to be excavated for easing the grades, often this rock is suitable to be used in the lower course.

When we first began to build roads the product from one-half inch to 1 inch was a waste product, but more recently we have used this product of the crusher for the bottom course on the subgrade, simply stipulating that it should not in any case occupy more than one-third in thickness of the base course. The base course is made of screen stone $1\frac{1}{2}$ to 3 inches in size, and, with the product of one-half to 1 inch, as above described, is put in a course of $5\frac{3}{4}$ inches in thickness, loose. We then pass a 10-ton steam roller over this stone, beginning on either edge, and rolling toward the center of the road, rolling the whole of it about six times, thus knitting the stone together in one compact mass. After this, about one-half inch in thickness of the screenings, as above described, is placed on this stone. The roller is then passed over it five or six times. We then take an ordinary road sprinkler, and sprinkling ahead of the roller, rolling and sprinkling the road, adding screenings or the dust where required until the whole

lower course is filled to the surface with screenings, making one compact mass 4 inches in thickness when finished.

The top course is formed of stone from 1 inch to 2 inches in size, and about $2\frac{3}{4}$ inches of loose stone are put on the road and the roller passed over them as described in the first course some five or six times, and then screenings are added, as in the first case. Then follows the sprinkling and rolling until the top course is welded into the bottom course, and the two are thoroughly filled with screenings, as above described, making a compact mass 6 inches in thickness when finished.

The earth wings on the road are usually from 3 to 5 feet on either side, making a 12-foot road, either 18 or 22 feet in width from one ditch to the other, as the case may be, and any other road the additional width of the macadam surface. In a dry season of the year, or when the road is first opened after traffic, we usually put an extra coat of stone dust or sand about one-half inch in thickness on top of the finished road. The most desirable stone we have found for the top course for these roads is the Hudson River trap rock, and in all sections of the State where it is convenient to be reached by canal this is generally specified, unless it is in exceptional cases, where we find a hard and durable granitic rock near the road to be constructed which will answer the purpose.

These roads have sustained the ordinary travel of a country district, leading to a populous city, for four years; some of them have been through a section of country having a sand subsoil for part of the way and another portion of the road on the side hill of a precipitous gully of brick clay.

Some persons have questioned whether in northern New York roads of the character herein described would withstand the extreme cold weather on a clay soil without being ruined by the action of the frost. Our experience has been that a road built as herein described, with the proper care and provided with rapid and successful drainage, will withstand the climate and clay soils of any portion of our State.

At some points in the State we have built this top surface of gravel instead of stone, as heretofore described. We have met with great success with these gravel roads, particularly with one in Columbia County, near the Massachusetts State line.

I am not in a position to personally advocate the appropriation of money; I am not in a position personally to advocate any special line of legislation. The duties of my office are purely executive. When the legislature appropriates money for a specific purpose, that is to be handled through my department, it is my duty, as an executive officer of that department, to handle that money in the most economical and honest way, to the best interest of the State. The following extract from my annual report for 1901 is given you to show what can be done with \$10,000,000, so that you can intelligently discuss

the question as to whether it is wise to bond the State of New York for \$10,000,000 for good roads or not:

SUGGESTED BONDING SYSTEM.

While great progress has been made in the work of improving our public highways, it has been suggested that some method should now be adopted by which a system could be put in operation for the purpose of improving within a very few years such a part of the principal roads in the State as would be of most benefit to the greatest number of citizens, and that this improvement should be conducted in a more expeditious manner than is now possible. To do this would require a larger annual expenditure on the part of the State than has yet been made, and if paid at one time would impose a larger burden upon the State than it would be wise to inflict in one, two, or even five years. The work which is being done is not only for the present, but for all time; and many, therefore, advocate an issue of State bonds for the purpose of improving our public highways under the provisions of the present State-aid act, claiming that this would fulfill two important requirements—first, there would be immediately available a sufficient sum to provide for the improvement within the next three or four years of a large proportion of the principal roads which are worthy of improvement, and, secondly, it would distribute the cost of such improvement over a term of years, making the annual payment so small as to be scarcely perceptible, and allowing those who would benefit by the work in the future an opportunity to help pay for its construction.

The funds derived from the sale of these bonds could be used for the purpose of paying the total cost of improvement of highways and the counties' share could be returned to the State in payments extending over a term of years equal to that over which the bonds extended.

With these points in view, the suggestion has been made that the State of New York should issue bonds for \$10,000,000 to be expended in the improvement of public highways in accordance with the provisions of the so-called State-aid act, namely, chapter 115, laws of 1898, these bonds to be payable at the expiration of seventeen years, bearing 3 per cent interest, and conditioned upon an equal annual payment which would meet both principal and interest at the end of the seventeen-year period. The money raised by these bonds, or so much thereof as might be necessary, would be immediately available and the improvement of public highways in the State could be carried on in a very expeditious manner, and one-half of the cost could be repaid to the State by the counties, making a total net expenditure by the State at large of only \$5,000,000.

The average annual payment which would be required to retire such a ten-million bond issue, both principal and interest, would be about \$760,000, being a State tax of not to exceed 6 cents per \$1,000 based on present conditions, and assuming that each county received its pro rata share a county tax of not to exceed 17 cents per \$1,000 for the above period of seventeen years.

With this amount of money available the work of improving our public highways could be taken up in the most advantageous and systematic manner; and it is claimed that a system of roads somewhat as shown on the map hereto appended would prove of incalculable value to every citizen of the State, combining as it does a line of continuous roads connecting the extreme ends of the State and also a network of roads connecting many of the county seats of the several counties. It is not claimed the roads as shown on the map are those most needed at the beginning, but the map is intended to show what could be accomplished in case the citizens of the State should look upon this project favorably, leaving the exact location in each county to be determined after consultation with its citizens. (See Pl. XIII.)

This plan would meet the wishes of many advocates, while many others claim that



ans of
high-
n was
lages,
travel
n are
of the
com-
nment)
plish

odifi-
ould
, that
s con-
s well

roved
itions
ould
, and
from
; and
ville,
ould,
three
g the
0,000
these
leted
which
1,425

map
d the

be as
l and
ning
ersons
assing
Bing-
nton
in a
ins, at
Bel-
Little
round
h this
points

west-
a, and

SKETCH MAP OF NEW YORK STATE SHOWING POSSIBLE LOCATION OF IMPROVED ROADS.

SCALE OF MILES
0 12 24 36



the questi
for \$10,00

While gre
ways, it has
system coul
years such a
the greatest
a more exp
annual exp
one time w
inflict in on
for the pre
bonds for tl
present Sta
first, there
improveme
pal roads w
cost of such
as to be sea
the future a

The fund
paying the
returned to
which the

With th
York shoul
lic highway
chapter 11
years, bear
which wou
The money
be immedi
could be c
repaid to t
large of on

The aver
bond issue
of not to c
each coun
\$1,000 for

With th
could be ta
that a syst
of incalcul
uous roads
connecting
roads as s
is intende
should loc
be determ

This pla

in these days of easy and quick communication between distant points by means of steam and electricity there is not the same necessity for long and continuous highways alone as was the case in the past, when the only means of communication was by way of boat and roads. Radiating from each of the principal cities and villages, and acting as the main arteries through which comes a large proportion of the travel of each separate county, are usually a few principal highways, which in turn are tapped at frequent intervals by cross roads. A network of roads connecting all of the county seats of the several counties (with the exception of those localities where communication is rendered extremely difficult or impossible by reason of forests or mountains, or where the travel is so limited as not to warrant the necessary improvement) would undoubtedly accommodate nine-tenths of the travel, and would accomplish the required result—namely, the greatest benefit to the greatest number.

The roads, as shown on the map which accompanies this report, with such modifications, of course, as would be required after a careful study of each locality, should be first constructed as speedily as possible. A study of the map will show, also, that in improving the roads connecting the county seats long continuous highways connecting the extreme portions of the State would be formed at the same time, as well as continuous roads crossing the State both at right angles and obliquely.

An expenditure of \$10,000 000 would construct upward of 1,250 miles of improved macadam road. Following along those counties which have thus far filed petitions for the largest amount of improved roads, it would seem that the first work should be taken up by connecting the counties running through the eastern, central, and southern portions of the State. This would naturally form a continuous road from New York City, by way of Albany, to Buffalo; from Albany to Rouses Point; and from Nyack, in Rockland County, through the southern tier of counties, to Mayville, in Chautauqua County, aggregating altogether about 1,090 miles. These roads could, with proper management, be economically and successfully constructed within three or four years, and the improvement of the remaining lateral roads connecting the county seats, as shown on the map, could then be taken up. Out of the \$10,000,000 fund there would be left sufficient for the improvement of about 160 miles of these lateral roads, which, added to the 175 miles of improved roads already completed and in process of construction, and for which funds have been provided, and which would be utilized in forming these lateral roads, would make a total of about 1,425 miles, or about one-half of the entire mileage, as shown on the map.

This would permit the construction of one-half of the roads shown on the map within three or four years from the time the money would be available, and the balance could be provided for as public sentiment called for it.

The possible location of the roads to be improved under this plan would be as follows: Beginning near the New Jersey State line in the county of Rockland and following through that county and Orange County to Newburgh; thence running westerly through the county of Sullivan, which is a section visited by many persons during the summer months, it being one of the health resorts of the State; passing on through Deposit, on the Delaware River, in Delaware County, westward to Binghamton, Oswego, Elmira, Corning, and Bath, with roads diverging from Binghamton to Auburn and from Auburn on to Lyons and Rochester, running obliquely in a northwesterly direction. From Elmira a branch road passes through Watkins, at the head of Seneca Lake, and continuing westward from Bath passes through Belmont, in Allegany County, and through the center of Cattaraugus County to Little Valley, its county seat; it then continues westerly to Mayville, with a loop around Chautauqua Lake, taking in the city of Jamestown. From Binghamton to Bath this road passes through a wide and fertile valley, which is occupied at different points by the Susquehanna, Chemung, and Canisteo rivers.

From Elmira a road passes in a northerly direction, bearing somewhat to the westward, in nearly a straight line to Rochester, passing through Watkins, Penn Yan, and

Canandaigua, or the road running in a northwesterly direction from Bath to Geneseo, passing through Batavia, Lockport, and thence to Buffalo, could be used if desired. This last line from Bath to Lockport or Buffalo is one of unusually easy grades and through a very rich section of farming country.

From Bath westerly to Belmont the road crosses the divide between the Canisteo River and the Genesee River; again from Belmont to Little Valley, in Cattaraugus County, a divide between the Genesee River and the Allegheny River is crossed; and from Little Valley westward to the northwestern end of Chautauqua Lake the road passes from the valley of the Allegheny River to the divide between the waters of Lake Erie and the Mississippi River, the loop continuing around Chautauqua Lake to the city of Jamestown. This section is very delightful, and is one much appreciated by persons seeking summer homes and outings, and has a National reputation.

Another road starts at Kingston, and, running a little northwest, follows the Esopus Creek to the head waters of the Delaware River, from whence it continues in the same direction to Norwich, in Chenango County. If desired, this road could be diverted to a northerly direction from Delhi to Cooperstown, at the foot of Otsego Lake, the home of Fenimore Cooper, and one of the many beautiful summer resorts of the State, and from thence northwesterly to Canandaraga Lake (or Schuyler Lake), at the head of which is located Richfield Springs, one of the summer and health resorts, and from Richfield Springs the road could run northwesterly to Syracuse, or more northerly to Utica, as may be desired.

From Norwich the road beginning at Kingston passes through Cortland and continues westerly through Ithaca, at the head of Cayuga Lake, and so on to Watkins; thence either westerly to Mayville or northwesterly to Rochester, as heretofore described. From Cortland a branch road leads in a northwesterly direction to Auburn, thence to Lyons and Rochester, and so on westward by way of Albion and Lockport to Niagara Falls, Tonawanda, and Buffalo.

A study of the map shows a direct line from Little Valley to Buffalo, and also a direct line from Mayville to Buffalo.

Starting in Westchester County, at White Plains, a road passes up the east side of the Hudson River through the counties of Westchester, Putnam, and Dutchess to a point opposite Kingston, passing through the county seats of the last three counties; thence to Kingston, or, if preferred, from Carmel to Newburgh, and thence up the west side of the Hudson River through Kingston to Albany and Troy, with a branch line from a point opposite Catskill through the city of Hudson to New Lebanon and the State line of Massachusetts (being the northeast corner of Columbia County), at which point the road joins the improved State roads of Massachusetts leading to the city of Pittsfield, and so on through that State, a branch line from this point also running in a northwesterly direction to the city of Troy.

From Albany or Troy a road passes through Schenectady, Amsterdam, and Fonda, with a branch road from Fonda through Johnstown and Gloversville to Lake Pleasant. Returning to Fonda, a road continues west from that point through Little Falls, in Herkimer County, Utica, Romé, Oneida, and so on to Syracuse, with a branch road from Rome, passing through Boonville and Lowville to Watertown and thence to Alexandria Bay. Starting from Syracuse one road passes northwest to Oswego, while another from Syracuse runs almost due north to Brewerton, Pulaski, Watertown, and so on to Alexandria Bay. Continuing westward from Syracuse the road would again lead through Auburn, Lyons, Rochester, etc., to Niagara Falls and Buffalo, as described over another line.

A road is also shown running from Watertown northeasterly through Philadelphia and Antwerp to Canton, with a branch road from Canton to Ogdensburg; from Canton easterly to Malone and Plattsburg; thence south through Elizabethtown, the county seat of Essex County; thence almost due south, through the valleys of the Bouquet and Schroon rivers, to Schroon Lake; thence along the shores of that lake

and through the valley of Schroon River to Warrensburg; thence on to Caldwell, at the head of Lake George; from there to Glens Falls and Greenwich, in Washington County, and on to Troy.

From Glens Falls a branch road leads southerly to Saratoga Springs, Ballston Spa, and Amsterdam, there joining the other system. The road taking in the belt of northern New York, as described, from Watertown to Saratoga Springs, together with a comparatively direct line leading from Lowville almost due east to Crown Point, passing through Lewis, Herkimer, Hamilton, and Essex counties to Lake Champlain, embraces all of the varieties of beautiful scenery for which this State is noted, from that of the Thousand Islands in the St. Lawrence River to that of the North Woods and the Adirondack region, as well as the beauties of Lake Champlain and Lake George.

This suggested improvement, as shown in this way, and the effect of issuing bonds of the State for \$10,000,000, as herein described, is outlined for the purpose of acquainting the citizens of this State with the possibilities of what can be done if after deliberate consideration such a system is deemed advisable.

Mr. LYON. I desire to present the following resolution. This, gentlemen, is a resolution that I consider of vast importance, and I would ask that each and every one of you give careful attention to the reading of the preambles and of the resolution itself.

Whereas legislation for the maintenance of the commercial supremacy of the State of New York is now pending tending to the enlarging and deepening of the Erie Canal; and

Whereas great values in property are created at either terminus of the canal, and the cities of New York and Buffalo, in return to the State at large for the commercial supremacy which is given to them by the deepening and enlarging of the Erie Canal, pay 86 per cent of the entire State tax; and

Whereas the deepening and enlarging of the Erie Canal enables the State of New York to control the price for the transportation of freight on the railroads of the State during the eight months of the year that the canal is open, thus benefiting the residents of the entire State; and

Whereas the cheapening of transportation of farm products from the West to the East brings the farm products of New York State into keen competition with the farm products of the West; and

Whereas in recent years the tonnage transported on the Erie Canal in any one year has not exceeded 4,000,000 tons, while the farm products raised in the State of New York equal or exceed at least 12,000,000 tons; and

Whereas on January 1, 1902, 1,308 miles of road were petitioned for improvement in the State of New York, of which 59 miles were built, 109 miles were under contract, and 238 miles were waiting an appropriation on the part of the State of \$1,000,000, the counties having appropriated \$960,000, being their share, and as the amount which the State can appropriate from its annual income is so uncertain, thus making the time for the completion of the roads so far distant; now, therefore, be it

Resolved, That we, the delegates at the third annual convention in the interest of road improvement, held in Albany, in the State of New York, on this 29th day of January, 1902, direct our standing committee to prepare and introduce the necessary bills to be enacted into laws to permit the State of New York, either at the fall election in 1902 or at some subsequent time, to submit a referendum to the people of the State to vote on the proposition that the State of New York issue bonds to the amount of \$10,000,000, at 3 per cent interest, and that the State comptroller be authorized to issue and sell said \$10,000,000 bonds from time to time as the counties

in the State may desire to improve their highways under the Higbie-Armstrong act, being chapter 115 of the laws of 1898, thus providing a constant fund to meet the State's share of road improvement.

We recommend the passage of the above legislation in favor of road improvement, as we believe that by the improvement of the main highways of the State of New York the cost of transportation, which is now estimated at 25 cents per ton per mile for farm products, can be so reduced that the raisers of farm products will be enabled to better compete at a profit with the farm products of the West than they do to-day and at the same time maintain the commercial supremacy of the State of New York.

The CHAIRMAN. The chair regards this proposition as the most important that has come before this convention, and thinks that we ought to have a general expression from the delegates here present upon the proposition.

Mr. LYON. I move that a call of the counties be taken and that a time limit of not to exceed five minutes be put upon the discussion.

The motion was adopted, and the call of the counties was proceeded with, as follows:

EXPRESSION OF SENTIMENT BY COUNTIES ON THE BONDING SYSTEM FOR
ROAD IMPROVEMENT.

Albany County.—Dr. EDWARD J. BEDELL. On behalf of this resolution, in the interest of Albany County, I wish to give my hearty assent to every word of it. Albany County, during the past session of the board of supervisors, has made provision whereby to bond the county of Albany for \$500,000, and we surely are in favor of bonding the State for \$10,000,000.

Broome County.—B. B. BADGER. I regard this as the most important piece of legislation that has been proposed in many years. I for one have advocated this in a small way for a number of years, and I assure you with pleasure I support the resolution.

Chemung County.—CHARLES CHAMBERLAIN. In regard to this resolution I can not speak for the sentiment of my county, as it has come up since I left home. I have no doubt but that our county would be in favor of this proposition. We were contemplating asking for roads, and the great drawback has been how long it would take us to get them. I myself, as a delegate, would be heartily in favor of this bond system.

Chenango County.—CHARLES G. BROOKS. I would say for myself and for the other representatives that we are in favor of the bond plan.

Cortland County.—N. F. WEBB. I am well pleased with the looks of the map, and I would like to live long enough to see the lines filled with macadam road, so we could get from one end of the State to the

other on the highway. I believe that I can speak for the people of Cortland County, and say that we would be heartily in favor of this resolution. We have got to have money to build these roads, and this seems to be the most advisable and fair plan.

Dutchess County.—E. LYMAN BROWN. As a representative of Dutchess County, I think I will voice the sentiment of our people when I say they would be heartily in favor of the proposed plan.

Erie County.—JAMES A. WOODARD. I would like to say in behalf of Erie County that I believe the sentiment is, we would be more than satisfied if a bill of this character were passed. I think it would have the unanimous consent of the board of supervisors of Erie County, and also of the people of Erie County.

Franklin County.—WILLIAM F. O'NIEL. I regard this proposition as the only advisable solution of the good-roads problem.

Genesee County.—DAVID CLARK. It seems to me that the people of Genesee County or any other county wouldn't object to bonding the State to open and maintain macadamized roads for their own accommodation: to get their own grain to the seaports or to the railroad station, as the case may be; and to cheapen the transportation of the products of their own soil. I believe that Genesee County would stand for bonding the State to improve their highways.

Greene County.—M. O'HARA. I heartily indorse that measure of raising money to improve the State roads. It looks to me as if that was the only advisable way to get at it. I voice the sentiment of our county in that respect.

Jefferson County.—SETH MATHER. Yesterday, as I understand it, we were all Fuller men; to-day we are Higbie men—Higbie-Armstrong men. I am just the same to-day as I was yesterday; and as far as this proposition is concerned, I am against it, and I will tell you why. How many farmers there are in this room I don't know, but I do know when the taxes are paid who will have to pay them; and I know, too, that a man upon a farm has about all he can do to make the 6 per cent on his investment, and he will do pretty well if he does that. If I have figured this correctly, the Armstrong-Higbie law is a good thing for cities, for all the citizens that are in favor of it; but as far as the country is concerned, the claim being that it does not have to pay the taxes, I think you will find as the laws are shaped to-day that the farmer will have to pay. As far as I am personally concerned, I wish to be quoted still that I am against this bonding, and I am a Fuller man to-day, as I was yesterday.

Monroe County.—CHARLES G. SCHOEN. I have listened to a great many speeches in our board of supervisors, and I am satisfied by those speeches the members are in favor of doing most anything for good roads. I am satisfied that they are willing to bond the State for this amount for good roads, and I think we are all heartily in favor of it.

Montgomery County.—R. SCHUYLER. I can say for the people of Montgomery County we are all anxious for the improvement of the highway. I represent the town of Mohawk, and in regard to the farmers' opposition, I will say there is no such a thing. I have been annoyed during the past year by their asking why there was not some improvement of the highway, and the only answer I could make was that the State has not appropriated liberally enough to reach us. I know the town of Mohawk, and the supervisors of the county of Montgomery are anxious for an appropriation to better the roads.

Nassau County.—WILLIAM WILLETTS COCKS. Nassau County has bonded itself for the money used in the construction of its roads, and the assessed values have greatly increased on account of the fine roads. We are going to vote with the majority to help you get good roads, and I want to impress upon you the idea that, where you can not get State aid, it seems to me the towns should build those roads themselves. We are going to vote for the appropriation.

New York County.—A. R. SHATTUCK spoke in regard to the excellent work done in New Jersey and Massachusetts, and at some length of the good results that could be obtained in New York State. He said: As far as I can speak for New York County, I am in favor of the scheme.

Oneida County.—W. PIERREPONT WHITE. Oneida County desires to be recorded in favor of bonding.

Onondaga County.—FRANK Z. WILCOX. It strikes me that this bonding scheme is the only way. I don't know how we are going to get good roads unless we have just such a scheme as this. If we have the bonding scheme at once and do the work at wholesale, and put through the State lines of road, that the people can use from one end of the State to the other, we shall reap great benefits therefrom. I am sure Onondaga County would be in favor of the bonding scheme, so that we might possibly get good roads within a lifetime.

Ontario County.—IRA P. CRIBB. The town I have the honor to represent has 23 miles of improved road. It has done this under a system of its own, and the towns in Ontario County enjoy the improvements we have made. Every delegate from Ontario County is in favor of this scheme.

Orange County.—C. H. WYGANT. It is not necessary for me to speak for Orange County. She has already spoken for herself on the matter. We have provided for the bonding of the county for \$200,000, which would be our full share.

Oswego County.—JAMES R. OTTMAN. I am a farmer from a farming county, and when I see that the gentlemen representing New York County, Erie County, and the counties that contain our large cities, realizing that they pay a large proportion of this tax, are anxious that we accept it, I should be ashamed if I should vote against the propo-

sition. I would be ashamed to say I did not favor it. I voice the sentiment of my county when I say we are thoroughly in favor of this appropriation. I think it will do more good than any act in recent years.

Otsego County.—S. E. ARMSTRONG. I think that while Otsego is in favor of good roads and wants them, I don't think they are in favor of this Higbie-Armstrong plan, for the reason it costs so much; but it seems to me my county would be more in favor of the State paying more under the Fuller system. If they would give us 50 cents on the dollar, the same as they do under the Higbie-Armstrong act, and let us build roads that cost less per mile, it would do us a great deal more good.

Saratoga County.—GEORGE H. WHITNEY. I would say I am heartily in favor of this scheme to bond the State for the benefit of the roads, and I think if the proposition is submitted to the people it will receive substantial support from Saratoga County.

Ulster County.—HENRY McNAMEE. Ulster would vote in favor of the resolution. We have a number of State roads in our county. We know what they are, and we want more. We believe this is the only way to get them.

Westchester County.—JOSEPH B. SEE. I am in favor of bonding the State both for good roads and for canals. I am a little more in favor of roads than I am of canals.

THE LEAGUE OF AMERICAN WHEELMEN AND THE "GOOD ROADS" LAW.

WM. PIERSON JUDSON, of Oswego, deputy State engineer: Mr. Chairmen and gentlemen, I see with us a representative of the League of American Wheelmen, which is the organization which began the good-roads movement in New York State, it being a matter of history that the original campaign of education for good roads was started in this State by the members of this organization, and that the law under which we are working was passed by their influence. I think we should now hear from Mr. Washburn, who is the chairman of the highway improvement committee of the New York division of the League of American Wheelmen.

LUCIUS H. WASHBURN, of Albany: Mr. Chairman and gentlemen, I have the honor of representing the New York State division of the League of American Wheelmen, being the chairman of the highway improvement committee. While the league has not given me any specific instructions in regard to the matters coming up before this body, its standing in the history of good roads in the State of New York is such as to place its position beyond any question. If we can give Mr. Bond the title of "the father of good roads," then my organization can claim the title of "grandfather."

When we started to agitate the improving of the highways in the

State of New York we found that outside of the cities themselves there was practically no sentiment in favor of good roads. The average man in the country was satisfied with the roads that his grandfather built. Through our different committees and our publications and our meetings, and keeping in touch with the bicycle clubs which were formed as wheeling interests advanced, we have done an immense amount of missionary work, and we feel that without our work a meeting such as this could hardly have been possible. I say this about the League of American Wheelmen, because I want the men here to understand what that organization has done. I can the better throw bouquets at my organization, because I was not a member of it at that time.

The League of American Wheelmen, since its inception, has constantly stood for highway improvements, and has originated or advocated every bill that has come up. We have had our representatives here at Albany every winter since 1882 or 1883. We have introduced our measures, and have had them knocked down again and again, and by-and-by got them through. We did everything in our power, both to get public sentiment aroused and to get the men in the different localities to bring pressure to bear on their assemblymen and senators, and we have sent our men to all these meetings in favor of good roads, and advocated them. Even while a great many of the wheelmen dropped their interest in good roads and switched off on side paths, the league stood fast on that point. It wanted good roads. A great many have their paths, but the league is still for good roads, and I am satisfied that the league will indorse the action taken yesterday toward abolishing the labor system on the roads; I am equally satisfied that we stand to-day back of this bond issue. It is a good, clean, logical way of getting roads now. We want roads and we are going to have them. We want them now and we are going to have them now—something that you and I can enjoy—and how are we going to get them, except by this method? How many of us were wealthy enough to give a check for the whole purchase price of the farm or home we own? Most of us were not, and we had to pay for part and mortgage the other part, and enjoy the homes while we were paying for them. We want good roads and we want them now. Our credit is good, and we can build these roads and pay for them while we are using them just as well as we can pay for and build them on the installment plan.

Gentlemen, the League of American Wheelmen will be with you in anything and everything that tends to improve the roads of the State of New York.

W. PIERREPONT WHITE. Mr. Chairman and gentlemen, I am compelled to bring up this resolution. I have listened to the roll call of the counties here in regard to a proposition to bond the State to the extent of \$10,000,000. The resolution as presented leaves me in doubt

as to whether that \$10,000,000 of State money, as the resolution is worded, is exactly in the best interest of those present. The resolution for \$10,000,000, as I understand it, simply provides the State's 50 per cent. If that is the case, how are our counties and towns to get their 50 per cent? Wouldn't it be best to follow the lines laid down yesterday and get the State bonds large enough to take care of the counties' 35 per cent and the towns' 15 per cent and give the counties and towns the benefit of the State credit? In order to test the sentiment, I offer the following amendment to Mr. Lyon's resolution:

That the State of New York issue bonds to the amount of \$20,000,000 at 3 per cent interest, 50 per cent of said bonds, or \$10,000,000, being the State share of the cost of road construction, 35 per cent, or \$7,000,000, being the county share of cost of road construction, and 15 per cent, or \$3,000,000, being the town share of the cost of road construction; that said bonds be paid at maturity, 50 per cent by the State, 35 per cent by the counties, and 15 per cent by the towns, and that an assessment per annum be made against the State, county, and towns benefited, to retire said bonds and pay the interest on them during a long period of years; and that said \$20,000,000 bonds be placed in the hands of the State comptroller, to be sold from time to time as the counties in the State may desire to improve their highways under the Higbie-Armstrong act, being chapter 115 of the laws of 1898, thus providing a constant fund to meet the State, county, and town share of road improvement.

It seems to me this would take care of the whole proposition on the best terms for the State, counties, and towns we represent.

The amendment was accepted by Mr. Lyon and by the convention.

At 11.55 a. m., on motion of Mr. See, the convention adjourned until 2.30 p. m.

VISIT OF THE CONVENTION TO THE GOVERNOR.

Mr. Bond, chairman of the committee appointed to wait on the governor, asked that the convention in a body call on the governor, and the delegation proceeded to the executive chamber.

ADDRESS OF MR. JOSEPH B. SEE TO GOVERNOR ODELL.

On the convention arriving at the executive chamber, at Albany, Mr. Joseph B. See, of Westchester County, addressed Governor Odell as follows:

IF IT PLEASE THE GOVERNOR: The members of the Good Roads Convention which are now before you have deputized me to speak for them. Two years ago I occupied a similar position. I stated at that time to Governor Roosevelt that the object of the convention was to secure a large appropriation by the legislature for highway improvement under what is known as the Higbie-Armstrong act of 1898, and asked him to approve whatever the legislature agreed upon.

In responding, the governor assured us that he was with us, and would approve anything reasonable that the legislature might do. He also said that the thing for the members of the convention to do was to show the members of the legislature that their constituents were in favor of large appropriations, and we would get

them. Two years have passed, and this large convention, representing every section of the State, even the great city of New York (which pays a large amount of the cost and receives no direct benefit), which sends an influential delegation from the Produce Exchange of that city, shows you, Mr. Governor, as well as the members of the legislature, that the people of this great State are very much interested in the improvement of our highways, and are ready and willing to spend a large sum of money for that purpose. The action taken by the boards of supervisors of the State during the past year in appropriating, in round figures, \$1,000,000, also shows the same thing. I have been a supervisor many years, and I know that supervisors generally follow the people, not lead them. The people of this State want good roads, and woe to any member of the legislature, to any other public officer, or to any party, the representatives of which stand as a barrier against the improvement of our principal highways. Mr. Governor, from your action in relation to the appropriation made last year, we come to you with the greatest confidence, feeling assured that (notwithstanding your well-known views and efforts in favor of economy) you will approve of a large appropriation the present year.

The Good Roads Convention has resolved to ask the legislature to appropriate \$1,000,000. That sum will only provide, on the part of the State, for carrying on the work for which the State engineer and surveyor has drawn plans and prepared specifications, and for which the boards of supervisors have already appropriated an equal sum. Pardon me if I speak for myself and for Westchester County. In that county we have adopted a system for highway improvement which is partly finished. Unless we get one million and a quarter dollars the work will have to stop, and Westchester will be out in the cold. With an appropriation of one million and a quarter dollars you will please every man, woman, and child in Westchester County.

Mr. Governor, I feel that you are with us, and that the few words I have spoken are all that is necessary. I thank you for your courtesy and attention.

REPLY OF GOVERNOR ODELL TO MR. SEE.

Replying to the above address of Mr. See, Governor Odell said:

I have a deep interest in the subject of building good roads, and as far as possible it shall be my aim to carry out the wishes of the supervisors' convention, whose members are here with you, and whom I am very glad to meet. It may not be possible for the State to expend as much money in highway improvement as the sanguine friends of the good roads movement may desire, but the result will be a distinct advance in a reform that has been slow in coming, and the progress may be expected to be continuous hereafter until the roads of New York State shall be made creditable to its people.

Last year I found that the appropriation of \$220,000 which the legislature decided upon would only carry the work of road construction down the list as far as Orange County, and I think that under the circumstances I was justified in having the amount increased to \$420,000, which was actually appropriated.

As to the amount to be appropriated this year, this will largely depend upon the other needs of the State. Of course, the legislature must act first, but it is safe to say that I will sign any bill which the legislature may send me.

The amount appropriated may not reach the sum desired by all of the counties, but I hope that it will come as near to it as is possible. I appreciate that good roads are a boon for the farmer seeking to take his produce to market and also for others, who, like myself, may wish to enjoy pleasure riding in greater comfort.

At the conclusion of the above reply each member of the convention was presented personally to the governor by State Engineer Bond.

WEDNESDAY, JANUARY 29, 1902—AFTERNOON SESSION.

The convention was called to order at 2.30 p. m.

Mr. WILCOX. Mr. Chairman, I would like to ask the different chairmen of the delegations representing the judicial districts to report at this time the names whom they have selected for the executive committee.

The following names were handed to the secretary:

STANDING COMMITTEE OF GOOD ROADS CONVENTION OF 1902.

First district.—John B. Uhle and Albert R. Shattuck, New York City.

Second district.—Col. C. H. Wygant, Newburgh, Orange County; Joseph B. See, Valhalla, Westchester County.

Third district.—E. J. Bedell, Selkirk, Albany County; Henry McNamee, Fly Mountain, Ulster County.

Fourth district.—G. W. Freligh, Niskayuna, Schenectady County; G. H. Whitney, Mechanicville, Saratoga County.

Fifth district.—W. Pierrepont White, Utica, Oneida County (chairman of committee); Frank Z. Wilcox, Syracuse, Onondaga County.

Sixth district.—Joseph H. Brownell, Windsor, Broome County; Charles Chamberlain, Elmira.

Seventh district.—Ira P. Cribb, Canandaigua, Ontario County; W. J. Greenfield, Moravia, Cayuga County.

Eighth district.—James A. Menzies, Buffalo; David Clark, Corfu, Genesee County.

WIDE TIRES.

The CHAIRMAN. The next thing on the programme is the discussion of wide tires by Mr. Frederick M. Power.

FREDERICK M. POWER, of Onondaga County: Mr. Chairman and gentlemen of the convention, at the present time the improved roads of this State have passed the experimental stage, there being a large number of miles finished and in use, and many applications for new sections are coming in.

How can we save the extreme rutting caused by the ordinary tires and gauge of axle? The question can be easily answered: Abandon hauling heavy loads on narrow tires and substitute wide ones, and also where the loads are large in bulk and need the wider wagon bed, simply put in use wide-gauged axles, and you have solved 75 per cent of the problem of lessening the wear and thereby lessening the expense of maintenance, on the hard, stone-covered road and the city pavement, either asphalt, brick, or stone—this also holds good, as well as on the proper-surfaced, graded, dirt highway.

In the years of 1893 and 1894 our work in Onondaga County required the hauling of heavy stone from the quarries to the village of Solvay. The ordinary wagons in use were not strong enough nor wide enough to take on the dimensions of blocks required. Wagons were built as follows: Four-inch tire, 2½-inch axle in front; length of the ordinary

gauge, rear wheels, 6-inch tire, 3-inch axle, lengthened out to track evenly outside of the front wheels, poled for two horses and two leaders when desired. The effect of these loads and use on dirt road was very favorable. The track for 12 feet wide was covered with broken stone, and grading and draining were done where needed, the wagons doing the surfacing when going out light. All of this work soon hardened the track to a useful road at all seasons of the year. Stone walls alongside were donated, being broken by hammer in place, and a covering of fine quarry chips completed the surface. Later the carts and wagons used about the works were equipped with similar wide tires. It is now the practice to repair a broken axle by lengthening out and keeping several inches of different lengths on all carts and wagons. New ones recently ordered have 4-inch tires, tracking in rear outside of front. This practice is conclusive to us of the value of such wheels and gauges to all roads.

In the country many are the objections made by the farmers and teamsters, which are not founded altogether on experience with, and use of, wide tires. The idea has, however, slowly won its way, and many are changing. I suggest legislative action for laws to enact a graded system of wide tires suitable for the loads to be carried, and giving a rebate to users of such wagons from the road tax, and to teamsters not landowners a limited time for stopping rebate and allowing such work to commence three or five years hence. This will give wagon makers an opportunity to construct and make the change. The rebates will repay the cost of changing or repairing, and the lessening of wear will be in favor of granting such favorable terms. The State paying one-half for the work on prominent roads, has a prior right to take a leading hand in this direction; the counties should follow, and the rest of the way ought to be comparatively easy. The western-bound emigrant wagon of Pennsylvania, when the western country was new, is still fresh in mind, and is a good example of its usefulness. The roads over which these wagons traveled are yet in good condition. The European countries have this matter under close regulation, and their common and principal thoroughfares are benefited by the use of wide tires. We need no better example than this. Years of trial prove the adage, "The wagon that carries the load should be the saver, and not the destroyer, of the road."

I have a letter from parties who are drawing heavy loads of brick with wide tires, showing heavy saving in cost of drawing, which I desire to have read:

SYRACUSE, N. Y., *January 28, 1902.*

DEAR SIR: I see that you are to read a paper on "wide tires" at the highway convention of supervisors to be held in Albany.

I have had a large experience with wide tires, and want to say for your encouragement and to those interested that we know positively that the wide tire is cheaper than the narrow tire for the user. We have a large brickworks 3 miles from Syracuse,

and are constantly hauling thousands of loads weighing over 2 tons on those tires. Our expenses for resetting tires has been reduced at least one-half. There does not seem to be the shrinkage of wood under the broad tire that is so common with the narrow tire. The broad tires wear at least twice as long. They also keep the roads in much better condition, as they do not cause ruts and do not cut the road.

We would not go back to the old tires under any circumstances.

And now a word about good roads in general: For twenty-five years we have been drawing heavy loads over a poor road. Within a few years over three-quarters of the road has been paved. On the poor road we never hauled over 1,000 brick at a load, and often only 600 or 700, and only two loads per day in the fall when the roads were bad. Now we are drawing 1,200 to 1,300 at a load, and deliver three loads per day, and the horses are in better condition. The wear and tear is reduced at least 50 to 75 per cent. This is a practical lesson in what good roads and wide tires will do for the whole community if adopted, and I feel like thanking you and all the rest who are working so hard for the good day coming when the United States will have the best roads of any country in the world.

Very truly, yours,

CHARLES H. MERRICK.

Mr. F. M. POWER, *Solvay, N. Y.*

Mr. WILCOX. I move that our standing committee be instructed to draft a suitable resolution, taking up the question of the width of tires and considering the same as applicable to counties that have received State aid or who shall receive State aid hereafter, and that a bill when passed, if passed, shall take effect on January 1, 1904.

The motion was adopted.

THE PRESS AND GOOD ROADS.

The CHAIRMAN. One of the most effective agencies upon which we must depend is the press of the State. Most of us are familiar with the work that the Tri-Weekly Tribune has been doing in the good-roads movement. We have with us to-day Mr. Arthur H. Battey, the editor of the Tri-Weekly Tribune, who will now address the convention.

ARTHUR H. BATTEY, of New York: Mr. Chairman and gentlemen, it is hardly within the province of a New York newspaper man to come to your convention and attempt to give you any pointers or instruction as to the construction or maintenance of highways, but as the looker-on sometimes sees points in a checker game which are overlooked by the players, it may be that there are points connected with the business as a whole which have forced themselves more plainly upon my notice than upon yours. That the highways and byways of New York State need a lot of attention, a lot of construction, and a lot of money, no one who has examined the subject even slightly will deny; and it is also undeniable that both the defects in the highways and the means of remedying them have not received that attention at the hands of the press to which they are entitled by their importance to the welfare of the community. A large part of this neglect has been due, until quite recently, to the fact that not many men are sufficiently well acquainted with the subject to talk on it intelligently,

and that those who were so equipped generally "turned down" newspaper men who sought information. They seemed to "fight shy" of the subject, to dodge the issue, or to try to get away from it—anything except come right out in the open and talk plainly. This was and is entirely wrong. It is unjust to the newspaper man, and perhaps unconsciously, but none the less effectively, brings about injustice to the road officials. A man who has left his mark—and it is a good one—on the highways of western Massachusetts was in the Tribune office not long ago, and in introducing him to the chief I spoke of him as being one of the best known highwaymen of his State. Back came the reply: "Not so very long ago the term highwayman was one of obloquy, but now it is becoming an honorable title." This is as it should be. To call a man a good highwayman would be paying him a compliment, and I am glad to see that this convention has been attended by so many men whom I know to be good highwaymen.

It is, I think, in no small measure due to the efforts which have been made through the Tri-Weekly Tribune, that the men who are held responsible for the roads are beginning to see the light. I attended a meeting of the Massachusetts Highway Association in Boston recently, and was surprised to find that no notice of the meeting had been sent to the newspapers, and that no reporter was present to let the public know what was going on. They know better now, but similar instances have occurred elsewhere. And right here lies the explanation of what so many officials who have honestly and faithfully tried to improve the highways have met when the question of an appropriation has come up before the legislature. Protests, growls about extravagance, charges of incompetency or carelessness, or worse, and a final scaling down of estimates, until the money voted was practically wasted because not enough was provided to be of any use. The officials had not taken the newspaper men into their confidence, the public knew little or nothing of what was being done, and queries as to what was being done with the road money were plentiful and pertinent.

The point that it is the duty of the press to aid any work or measure tending to the public benefit seems to have been ignored or utterly lost sight of. But that is just what the press is for, and is what it is doing, and what it will do more fully and freely as soon as those interested see fit to give it a chance. Those two lines by Robbie Burns,

If there's a hole in a' your coats, I rede ye tent it;

A chiel's amang ye takin' notes, and, faith, he'll prent it,

are true to-day as ever, and I earnestly hope that when the press is thoroughly waked up it will find few holes in the coats of the supervisors of New York. Speaking for my own part in the work, I may say plainly that no criticisms unfavorable to a State, city, county, or town official has been or will be made save in a spirit of kindness, with

a view of correcting a mistake rather than a chronic fault-finding, and with a view of ultimately making the roads, big and little, of the greatest State in the greatest nation on earth, superior to those anywhere else on earth.

It can be done, gentlemen, and the press can and will help you do it. There is no good reason why they should not be, and the only excuse of their being in the condition they are in is lack of widespread, popular understanding of the importance of the problem and the benefit which will accrue from expedient and business-like solution. Rest assured that the era of road construction along scientific lines in the Empire State has only just begun. The State which, through the Erie Canal, gave to New York City a commercial preeminence which the combined ports of the Atlantic coast have not been able to assail, can make its own internal commerce of corresponding proportions, do away with the isolation and loneliness of life on the farm, bring its country folks, young and old, into close and beneficial touch with the life of the town and city, save time, trouble, money, and health for all its people by proper handling of the road question; and what is more to the point, the State, which can do all these things, will do them, for the press is after them, and what the press goes after good and hard it generally gets. You, gentlemen, and your successors can be at the head and front and finishing of this movement if you so will it. Show that you are in earnest: show that you mean business; when you have anything to say, say it; and when you haven't, dig up something to talk about, and above all don't be afraid of the reporter. He won't bite. I have eaten, drunk, and slept with him, summered and wintered with him, and when you treat him right you will find that he is a good fellow to be friends with and one who will do the right thing whenever he gets a chance.

Announcement has been made by Senator Cocks, of Nassau County, that he wants to know about the present system of road construction, and whether or not it would be well to connect the present disconnected patches and pieces of improved highways, and incidentally mentioned the possibility of a trunk road across the State through the southern tier of counties, with another one through the center of the State to Buffalo. There are lots of people besides Senator Cocks who want to know, and as for the road through the southern tier, the Tri-Weekly Tribune has prepared a map covering the routes, and is prepared to take it up and work for it in earnest, and with a hope of bringing about its accomplishment. It seems like a big undertaking, but really, is there any undertaking which, when it once commends itself to the sound common sense or the business instinct of the average New Yorker, is too big for the New Yorker to tackle and accomplish? I don't know of any, and I am not willing to think that you do. It was an enormous undertaking to build "Clinton's ditch" from the

lakes to tide water, and New York was not so well equipped then with men or money as she is to-day; but she did it, and although millions on millions have been poured into that ditch since then, it would take a better man at figures than I am to tell how many millions that have come to the State through that same ditch. The great Erie Canal is a monument to the wisdom and foresight of our fathers. Let us go a step onward and leave to our sons a lasting monument in the shape of a road system which will be unmatched anywhere for utility and duty, and of so much importance to the citizens of our State that there will always be a rivalry between the State and the counties as to which can do the most to improve it.

In all this work you will find the press a careful, consistent, helpful guide, counselor, and friend—by this I mean the great body of reputable newspapers throughout the State. If you falter or make a misstep they will tell you so plainly, and at the same time try to straighten things out so long as you mean well. If you persist in wrongdoing after the right has been shown you, you will find them merciless; and no public officer has so high a position or is so fixed in tenure that he may escape censure and condemnation. There is no threat in this, gentlemen; it is simply cold fact, and there are many men in this great State of ours who know how cold and hard a fact it is.

I have come to you, gentlemen, with a message of good will. Speaking for the good-roads department of a newspaper which will never be forgotten while the nation lives, I offer you cordial and hearty support in all of your work which makes for the public welfare, and would ask your careful consideration of the wish, hope, and request, that we may work side by side in harmony and as allies. Our side is ready, and the question is up to you.

WILLIAM PIERSON JUDSON, of Oswego, deputy State engineer of New York: I have in my hand two papers prepared by gentlemen prominent in the good-roads movement in the United States, and whom State Engineer Bond had hoped would be present in person. If I were addressing a meeting of the civil engineers of the United States it would not be necessary for me to do more than mention the names of the authors of the papers. The one, entitled "Relation between macadam roads and electric street railways," is by Edward P. North, M. Am. Soc. C. E., who has had charge of the roads and pavements of New York City, and who is the author of one of the best known text-books on "Roadmaking and maintenance," which is among the valued books of every student of road building, and which has been studied with profit by engineers everywhere.

The other paper, entitled "The relation of common roads to railroads," is by Prof. Lewis M. Haupt, M. Am. Soc. C. E., and member of the Isthmian Canal Commission, who would have been with us to-day but for an important meeting of the Commission, which made it impos-

sible. The convention is fortunate that the personal relations of State Engineer Bond and myself with these gentlemen are such that, notwithstanding the important duties which occupy them, they have taken the time to specially prepare these valuable papers, which you will hear with profit and which will form, with the similar papers read yesterday, prominent features of the published proceedings of this convention.

RELATION BETWEEN MACADAM ROADS AND ELECTRIC STREET RAILWAYS.

By EDWARD P. NORTH, M. Am. Soc. C. E.,

Of New York.

No one can look at the returns of the last census without concern for the future of our rural districts, and consequently on the future of this State. The rewards offered to ambition in 22 counties in this State have in the past ten years grown relatively, if not absolutely, less, and they are being depopulated. The list of those counties, with their population in 1900 and the loss since 1890, is given as follows:

Counties.	Popula- tion in 1900.	Loss since 1890.	Counties.	Popula- tion in 1900.	Loss since 1890.
Alleghany.....	41,510	1,739	Putnam.....	13,787	1,062
Chenango.....	36,568	1,208	Rensselaer.....	121,697	2,814
Columbia.....	43,211	2,961	Schoharie.....	26,854	2,310
Cortland.....	27,576	1,081	Schuyler.....	15,811	900
Essex.....	30,707	2,345	Seneca.....	28,114	113
Greene.....	31,478	120	Tioga.....	27,951	1,984
Lewis.....	27,427	2,379	Washington.....	45,624	66
Livingston.....	37,059	742	Wayne.....	48,660	1,069
Madison.....	40,545	2,347	Wyoming.....	30,413	780
Orleans.....	30,164	639	Yates.....	20,318	683
Oswego.....	70,881	1,062			
Otsego.....	48,939	1,922	Total.....	845,294	30,266

That is to say: In the 22 counties mentioned there has been a decrease in population of over $3\frac{1}{2}$ per cent during the past ten years. In this period the State as a whole has gained 1,270,159, a gain of 21.2 per cent, but the gain in cities of 25,000 inhabitants or more has been 1,268,769, so that the gain in our population has been almost entirely made in cities.

In the city of New York, comparing equal areas, the increase between 1890 and 1900 has been from 3,437,202 to 4,507,414, or 1,070,212, which nearly accounts for the net urban gain, some cities of 25,000 and over having lost population.

It will be noticed that of the five counties on the east side of the Hudson from Putnam to Washington, inclusive, all but Dutchess have lost population. The increase in that county, 3,791, is offset by a gain in the population of Poughkeepsie of 3,859. The net loss to the five counties is 3,065 inhabitants.

Comparing our condition with the whole country and neighboring States, we find:

States.	Population in 1900.	Ten years increase.	Pro rating of increase.
United States.....	76,303,387	12,937,008	20.7
Connecticut.....	908,420	162,162	21.7
Massachusetts.....	2,805,346	566,403	25.3
New Jersey.....	1,883,669	438,736	30.4
New York.....	7,268,894	1,270,159	21.2

The comparison shows that among the States only Nevada has lost population. In Connecticut there has been a loss in Tolland County, which lies east of Hartford, of 558. In Massachusetts there has been a loss in two counties—Barnstable 1,346, and Nantucket 262; the first of these is east of Buzzards Bay, including Cape Cod, the other is an island. There has also been a loss in two counties of New Jersey—Burlington 287, which lies south of Trenton and east of Camden, and Hunterdon 848, which lies southeasterly from Phillipsburg.

A more intimate knowledge than I possess is requisite for an ex-cathedra statement as to the causes that have reduced the rewards of enterprise and made a decrease in the attractiveness of the above-mentioned 27 counties as a place of residence, and there is a promptly acknowledged inability to prescribe a certain specific for the difficulty. But it is competent, and seems highly desirable, to call the attention of this body to the facts enumerated, and ask a serious study by individual members to be followed at a later meeting by a classification of the facts found which relate to and govern this extremely unsatisfactory movement in our population.

As there is difficulty in arranging any series of facts, or even in looking for them without the aid of some theory, even if it is to be promptly discarded, it is suggested that the inquiry should be commenced on the supposition that lack of convenient and cheap transportation may be the governing factor in these changes of population.

There can be little doubt in any mind that cheap and rapid transportation, affording convenient access to large markets, controls the position of large industries; or, in other words, these will be located where the cost of assembling the raw materials for manufacture and distributing the finished products is the smallest. The high cost of wagon transportation over unimproved roads now precludes profitable manufacturing at the site of the numerous small powers once used, and it is doubtful if they will ever again be employed as they were fifty years ago, diversifying the industries of the country districts and making first-class mechanics of nearly all farmers' boys.

The occupation of the country by farmers and by those who are not obliged to be in some town every day, with those suburbanites who are known as commuters, stands on a different and more hopeful basis. Farming is an occupation that is generally pursued for gain rather than for the sake of unremunerated labor. But the farmer is confronted with the fact that while all cost of transportation must in some ratio be divided between the producer and consumer, he generally sells in a nearly satisfied, if not glutted, market, where the cost of transportation falls on him, so that he in general is the heaviest loser by roads over which the cost of haulage is excessive.

When his day's work is done he joins his wife and children in the leisure class, and becomes, like the commuter, dependent on the ease with which he can reach the various centers of interest near him; and good macadam roads have already proved their value in keeping the farmer's family contented in their home, as well as increasing the net rewards of their labor.

The choice of residence by commuters is governed by mixed considerations of time, cost, and attractiveness of locality, and good roads are a weighty factor in the attractiveness of a locality. It is probably because New Jersey commenced building macadamized roads about thirty years ago that the State is able to show a 30 per cent increase in her population, while the five counties east of the Hudson and north of Westchester, without improved roads, show a net loss of slightly more than 1 per cent. This, however, is not entirely due to the absence of improved roads; it is claimed that the railroads extending north and south through these counties take less pains to develop their commuting traffic than do the roads through either New Jersey or Connecticut.

Some theories of this kind seem necessary in accounting for decreased population in a beautiful and healthy country near to and closely connected with the largest and

richest city on this continent, whose business men are filling up the near-by counties of New Jersey and Connecticut.

If we assume that the average wealth of inhabitants of this State is equal to that of the average inhabitant of the whole country, as stated by the Treasury Bureau of Statistics, namely, \$1,235.86 per capita, the withdrawal of 30,266 persons from country homes in this State implies a loss of over \$4,000,000 to the localities from which they moved.

Judging from a limited experience, it may be safe to say that a good road will attract both residents and business. These make the road attractive to trolley companies, and a trolley road, obviating the necessity of getting out either a horse or wheel, makes the locality still more attractive to residents and business.

It is well known that in many parts of Europe the inhabitants congregate in small villages, walking miles to their farms, and it is probable that under the improved ease of circulation presented by trolley cars the population of the country will concentrate on roads occupied by them. When any such development occurs the trolleys will be double tracked, and the value of a road of ordinary width for traffic by wagons, etc., will be greatly impaired, if not destroyed, as the wagon traffic is becoming more dense and more important to the locality.

On Fifth avenue, in the city of New York, the traffic has outgrown the capacity of the wheel way, and it must be widened at a great cost. In London the widening of Cheapside and Newgate streets was completed about ten years ago, and it is claimed that the operation must be repeated on Cheapside, as that thoroughfare is again overcrowded. These widenings have been accomplished at what was held to be prohibitory cost, on account of the destruction of the buildings fronting on them. Like widenings will undoubtedly be necessary on most of the roads that are to be macadamized in this State, and they should be completed before improvements add materially to their cost.

The feeling of antagonism to trolley roads, which destroy a newly made macadam and permanently impair the usefulness of the road for wagons, automobiles, and wheels, should not make us forget their great value in distributing population. At the same time, the companies exploiting them should be required to join the local authorities in widening all roads used by them. In some parts of Massachusetts the entire cost of widening roads has been thrown on the trolley company. This may not be entirely just. The question, however, should receive the study of this convention, both now and hereafter; for such a distribution of the cost as shall not impede trolley building to the loss of the country inhabitants and real estate values, and at the same time be just to the property owners, can not be made without consideration.

THE RELATION OF COMMON ROADS TO RAILROADS.

By LEWIS M. HAUPT, M. Am. Soc. C. E.,

Consulting Engineer, of Philadelphia, Pa.

The value of a property is largely dependent on its accessibility and earning capacity. If a producer is obliged to pay out all of his profits to reach the market, his labor is in vain and his property unprofitable and unsalable. If, however, there is more than a sufficient margin between cost and market price to pay for transportation and other expenses, then his property becomes valuable, and the larger this margin is the more valuable does the property become.

The question, therefore, is one of practical importance as to the best way of reducing the cost of reaching the market and thus increasing the profits.

As railroads can not be built to each farm, but must follow the lines of least resistance and greatest resources, and as they are operated by corporations which have the power to regulate the rates within certain limits on different classes of freight,

and to change the classification at pleasure on giving notice, it is evident that a large part of the cost of the movement is beyond the control of the individual. The rail charge constitutes but a portion of the total cost, however, and it may be possible to effect economies in other links of the chain which will extend the market range without increasing the ultimate cost.

Nearly all commodities are subject to a longer or shorter haul by wagon at both ends of the route before reaching the consumer, and from the statistics collated by the United States Office of Public Road Inquiries it appears that the average cost of hauling on an earth road is many times greater than on a railroad and still greater than on a waterway. As these three systems frequently enter into the path of the commodity on its way to market, they all constitute mutually dependent elements of a system, and correspondingly affect the cost. Their relative values may best be determined by stating the average cost for transportation over each link; thus, on an earth road the stated charge is 25 cents per ton-mile; on the railroad it is about three-fourths of a cent, and on water it varies from one-fourth to one-twentieth, according to vessel and channel. The relation of these charges may be more clearly stated by comparison with the lowest water rates taken as a unit. Thus, a wagon road would be 500 times more expensive, a railroad 15 times more, and a canal 5 times more than the ocean rate, which means that the commodity can only be carried a correspondingly shorter distance before its margin is absorbed by the cost of its movement; or in other words, a product that could be carried only 1 mile on an earth road could be hauled 33 miles on the railroad or 500 miles on the ocean for the same charge. The latter medium is, therefore, the natural highway of commerce, and the sooner a commodity can be made to reach a waterway the greater will be the economy and the farther its range for a given cost.

But the expenses of movement on a highway are composed of many items and affected by variable conditions, as the grades, distances, soils, drainage, and surface of road, all of which pertain to the way, and are subject to the engineer or supervisor; but there are others, as the width of tire, length of axles, number of wheels, and other factors, which also affect the movement.

The effect of grades and the character of the surface may be best expressed in figures in the form of tables (appended), from which it appears that an earth road offers twenty times more resistance than an iron tramway, thirteen times more than asphalt, ten times more than a plank road, and twice as much as a macadam road. This is independent of everything but the surface metalling. By reducing the grades, shortening the distances, improving the surface and the drainage, and removing the points of greatest resistance there are many roads on which the cost could readily be reduced to less than one-half of the present charge, and the capacity of the horse be largely increased without extra effort.

The following table shows the force necessary to move a load of 6 tons on a macadamized road at a speed of 3 miles an hour:

Resistance of grades.

Grade.	Force in pounds.	Equivalent length of level road.
Rising 1 in 600	286	1.085
Rising 1 in 300	309	1.170
Rising 1 in 200	331	1.255
Rising 1 in 100	398	1.510
Rising 1 in 50	533	2.019
Rising 1 in 25	712	2.699
Rising 1 in 10	1,600	6.068

The following table shows the force required to draw 1 ton on a level on different materials:

Resistance of surfaces.

Surface.	Pounds.	Surface.	Pounds.
On an iron tramroad	10	On poor stone-block surface	50
On an asphalt surface	15	On cobblestone surface	90
On a wooden surface	21	On macadam surface	100
On best stone-block surface	23	On earth road	200

By reducing the resistance to haulage on a common road even to one-half, the tributary territory may be doubled and the tonnage correspondingly increased, so that it would seem to be the cheapest method of increasing the short-haul tonnage of the railroads if those corporations would assist in the improvement of the highways, either directly or by encouraging localities to do so, by making specially low rates on stone or other materials used in road construction.

It is a well-recognized fact that the distance which a commodity may be carried is a function of its value, and that no freight of low value can bear a long overland haul. Thus, there are few forest products which have sufficient margin to permit of rail transportation for more than a few hundred miles, as their average value is about \$11 per ton; so they are sent by water wherever practicable, and it is found that about 75 per cent of the low-priced articles move by water while the great bulk of the rail freights are composed of high-priced merchandise which has an ample margin for long hauls, the average value being over \$300 per ton.

It would seem to be to the interest of all parties, therefore, to reduce the cost of transportation, while maintaining stable prices by reducing the resistances between the producer and consumer as rapidly as possible by a systematic improvement of the highways of the State, for they are now the greatest obstacles to interstate commerce and the most expensive point in the line of communications.

FINAL PROCEEDINGS.

The resolution offered by Mr. Conboy in regard to assembly bill No. 213 was reported favorably by the committee on legislation, and the resolution by Mr. Donnafield for keeping the highways free from snow during the winter months was reported adversely by the committee on resolutions.

Votes of thanks were extended to the chairman and secretary, to Mr. Edward A. Bond, to Mr. D. E. Pugh, and to the gentlemen who prepared and read papers, after which the convention adjourned sine die.

